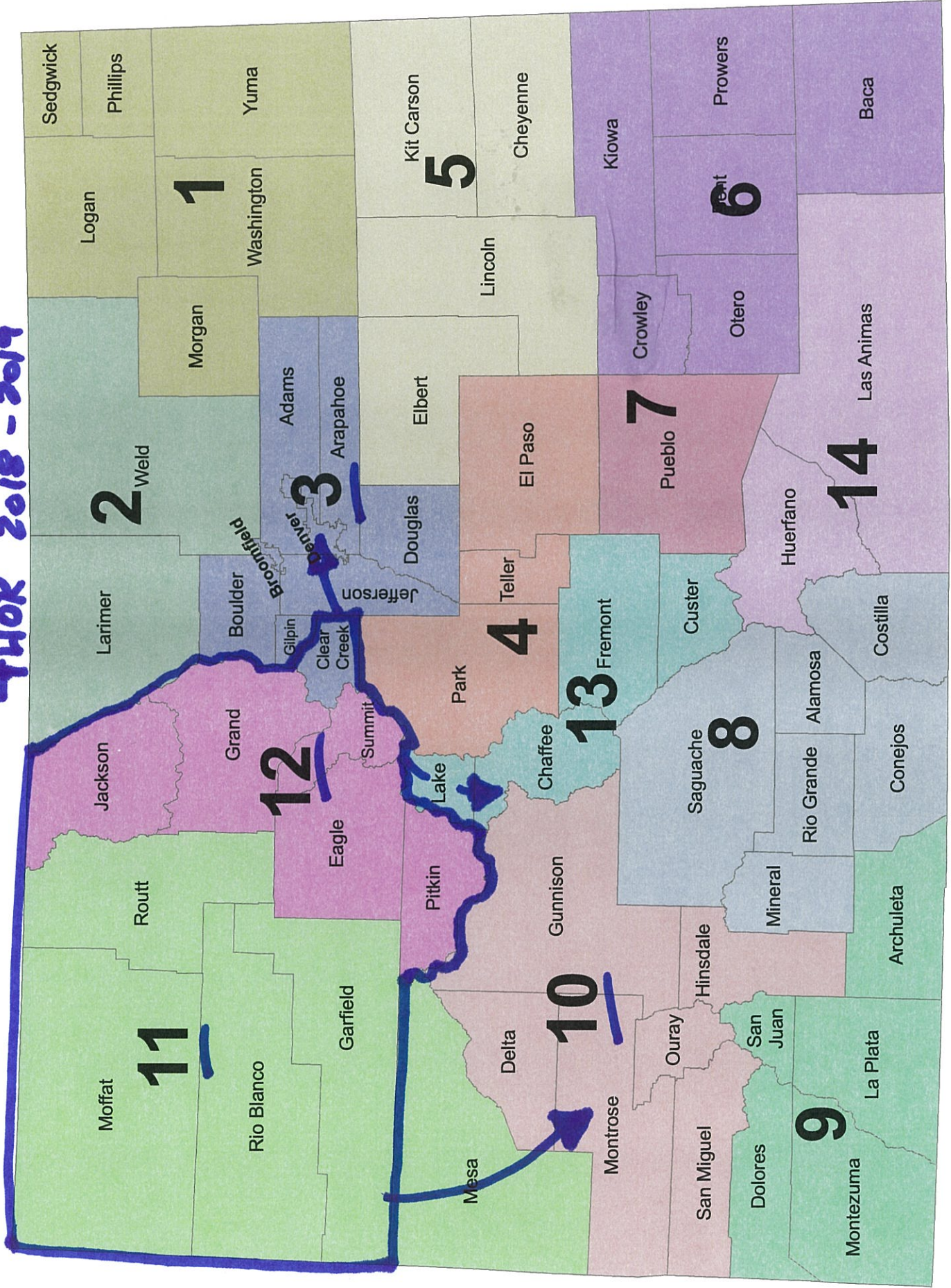


COLORADO PLANNING AND MANAGEMENT REGIONS

THOR 2018 - 2019



Project THOR - MMC Host Summary of Charges

| Option 1 - Baseline approach - DOLA Funds Projects 1, 3 and 4 only | | | | | Option 1 MMC Totals | | | |
|---|--------------------------|----------------------------|---------------------------|--------------------|----------------------------|-------------------------|---------------------------|--|
| MMC Host | Project 1 NEP | Project 3 LMMCP | Project 4 LFCP | MRC | Total Project Cost | Local Cash Match | Total DOLA request | |
| City of Aspen | \$53,204.82 | \$0.00 | \$0.00 | \$5,049.13 | \$53,204.82 | \$30,638.06 | \$22,566.76 | |
| City of Craig | \$76,006.89 | \$0.00 | \$0.00 | \$7,413.04 | \$76,006.89 | \$43,768.66 | \$32,238.23 | |
| Town of Eagle | \$60,805.51 | \$93,592.34 | \$180,268.97 | \$5,770.43 | \$334,666.83 | \$171,945.59 | \$162,721.24 | |
| Eagle County | \$60,805.51 | \$143,457.14 | \$274,322.91 | \$5,770.43 | \$478,585.56 | \$243,904.96 | \$234,680.61 | |
| Clear Creek County | \$121,611.02 | \$0.00 | \$0.00 | \$11,540.87 | \$121,611.02 | \$70,029.86 | \$51,581.16 | |
| Summit County | \$136,812.40 | \$0.00 | \$0.00 | \$13,183.48 | \$136,812.40 | \$78,783.59 | \$58,028.81 | |
| City of Glenwood Springs | \$76,006.89 | \$85,020.00 | \$19,471.40 | \$7,413.04 | \$180,498.29 | \$96,014.36 | \$84,483.93 | |
| Rio Blanco County | \$60,805.51 | \$0.00 | \$0.00 | \$5,770.43 | \$60,805.51 | \$35,014.93 | \$25,790.58 | |
| Northwest Colorado Broadband | \$76,006.89 | \$0.00 | \$0.00 | \$7,413.04 | \$76,006.89 | \$43,768.66 | \$32,238.23 | |
| Town of Gypsum | \$76,006.89 | \$93,592.34 | \$340,609.84 | \$7,413.04 | \$510,209.08 | \$260,869.76 | \$249,339.32 | |
| Town of Vail | \$76,006.89 | \$0.00 | \$0.00 | \$7,413.04 | \$76,006.89 | \$43,768.66 | \$32,238.23 | |
| Totals | \$874,079.24 | \$415,661.83 | \$814,673.12 | \$84,150.00 | \$2,104,414.19 | \$1,118,507.10 | \$985,907.10 | |

Notes

Project 1 (NEP) includes 1st year of CDOT Lease
 CDOT Lease not eligible for DOLA Grant

Project THOR - MMC Host Summary of Charges

| Option 2 - Use DOLA Funding to pay for CDOT IRU for 3 years - Reduces MRC to all entities for 2yr startup period | | | | | | | | |
|---|-----------------------|---------------------|---------------------|----------------------------|---------------------------|-------------------------|---------------------------|--|
| MMC Host | Project 1 | Project 3 | Project 4 | Option 2 MMC Totals | | | | |
| | NEP | LMMCP | LFCP | 1&2 Yr. MRC | Total Project Cost | Local Cash Match | Total DOLA Request | |
| City of Aspen | \$67,375.26 | \$0.00 | \$0.00 | \$4,458.70 | \$ 67,375.26 | \$ 34,673.72 | \$ 32,701.54 | |
| City of Craig | \$96,250.37 | \$0.00 | \$0.00 | \$6,569.57 | \$ 96,250.37 | \$ 49,533.88 | \$ 46,716.49 | |
| Town of Eagle | \$77,000.29 | \$93,592.34 | \$180,268.97 | \$5,095.65 | \$ 350,861.61 | \$ 176,557.76 | \$ 174,303.85 | |
| Eagle County | \$77,000.29 | \$143,457.14 | \$274,322.91 | \$5,095.65 | \$ 494,780.34 | \$ 248,517.13 | \$ 246,263.22 | |
| Clear Creek County | \$154,000.59 | \$0.00 | \$0.00 | \$10,191.30 | \$ 154,000.59 | \$ 79,254.21 | \$ 74,746.38 | |
| Summit County | \$173,250.66 | \$0.00 | \$0.00 | \$11,665.22 | \$ 173,250.66 | \$ 89,160.98 | \$ 84,089.68 | |
| City of Glenwood Springs | \$96,250.37 | \$85,020.00 | \$19,471.40 | \$6,569.57 | \$ 200,741.77 | \$ 101,779.58 | \$ 98,962.19 | |
| Rio Blanco County | \$77,000.29 | \$0.00 | \$0.00 | \$5,095.65 | \$ 77,000.29 | \$ 39,627.10 | \$ 37,373.19 | |
| Northwest Colorado Broadband | \$96,250.37 | \$0.00 | \$0.00 | \$6,569.57 | \$ 96,250.37 | \$ 49,533.88 | \$ 46,716.49 | |
| Town of Gypsum | \$96,250.37 | \$93,592.34 | \$340,609.84 | \$6,569.57 | \$ 530,452.55 | \$ 266,634.97 | \$ 263,817.58 | |
| Town of Vail | \$96,250.37 | \$0.00 | \$0.00 | \$6,569.57 | \$ 96,250.37 | \$ 49,533.88 | \$ 46,716.49 | |
| Totals | \$1,106,879.24 | \$415,661.83 | \$814,673.12 | \$74,450.00 | \$2,337,214.19 | \$1,184,807.10 | \$1,152,407.10 | |

Notes

Project 1 (NEP) includes 3 years of CDOT Lease
 Assumes DOLA Grant for 50% of 3 year total
 Reduces MRC fees for initial two years, with an increase in local match
 Savings of \$166,500 over Option 1

Project THOR - MMC Host Summary of Charges

| Option 3 - DOLA Funds full 10yr CDOT IRU as CFLAP Project - Reduces MRC to all enties for 10yr period | | | | | | | | |
|--|---------------------|---------------------|--------------------------------|---------------------|----------------------------|---------------------------|-------------------------|---------------------------|
| MMC Host | Project 1 | Project 2 | Project 3 | Project 4 | Option 3 MMC Totals | | | |
| | NEP | CFLAP | LMMCP | LFCP | 10Yr MRC | Total Project Cost | Local Cash Match | Total DOLA request |
| City of Aspen | \$46,119.61 | \$52,758.09 | \$0.00 | \$0.00 | \$4,458.70 | \$98,877.69 | \$30,638.06 | \$68,239.63 |
| City of Craig | \$65,885.15 | \$75,368.70 | \$0.00 | \$0.00 | \$6,569.57 | \$141,253.85 | \$43,768.66 | \$97,485.18 |
| Town of Eagle | \$52,708.12 | \$60,294.96 | \$93,592.34 | \$180,268.97 | \$5,095.65 | \$386,864.39 | \$171,945.59 | \$214,918.81 |
| Eagle County | \$52,708.12 | \$60,294.96 | \$143,457.14 | \$274,322.91 | \$5,095.65 | \$530,783.13 | \$243,904.96 | \$286,878.17 |
| Clear Creek County | \$105,416.24 | \$120,589.91 | \$0.00 | \$0.00 | \$10,191.30 | \$226,006.16 | \$70,029.86 | \$155,976.29 |
| Summit County | \$118,593.27 | \$135,663.65 | \$0.00 | \$0.00 | \$11,665.22 | \$254,256.92 | \$78,783.59 | \$175,473.33 |
| City of Glenwood Springs | \$65,885.15 | \$75,368.70 | \$85,020.00 | \$19,471.40 | \$6,569.57 | \$245,745.25 | \$96,014.36 | \$149,730.88 |
| Rio Blanco County | \$52,708.12 | \$60,294.96 | \$0.00 | \$0.00 | \$5,095.65 | \$113,003.08 | \$35,014.93 | \$77,988.15 |
| Northwest Colorado Broadband | \$65,885.15 | \$75,368.70 | \$0.00 | \$0.00 | \$6,569.57 | \$141,253.85 | \$43,768.66 | \$97,485.18 |
| Town of Gypsum | \$65,885.15 | \$75,368.70 | \$93,592.34 | \$340,609.84 | \$6,569.57 | \$575,456.03 | \$260,869.76 | \$314,586.28 |
| Town of Vail | \$65,885.15 | \$75,368.70 | \$0.00 | \$0.00 | \$6,569.57 | \$141,253.85 | \$43,768.66 | \$97,485.18 |
| Totals | \$757,679.24 | \$866,740.00 | \$415,661.83 | \$814,673.12 | \$74,450.00 | \$2,854,754.19 | \$1,118,507.10 | \$1,736,247.10 |
| | | | | | | | 39% | 61% |
| | | | 3yr. Contracted MRC Cash Value | | \$2,680,200.00 | | 133% | |

Notes

- Project 1 (NEP) does not include any CDOT Lease fees
- Project 2 (CFLAP) assumes a 10yr. IRU for CDOT fiber, without 3% escalator
- DOLA will use matching dollars from 3yrs of contracted MRCs to increase match to 61% of project total
- Local cash match from all MMC Hosts will remain the same as in Option 1
- Option 3 will provide overall savings of \$349,200 over the first 3 years, and \$1,164,000 over 10 years as compared to Option 1



MAMMOTH
NETWORKS



NORTHWEST COLORADO COUNCIL OF GOVERNMENTS

PROJECT THOR

7.17.2018

Contents

- Project THOR overview
 - Concept
 - Roles
- Network Design
 - Routes and providers
 - Equipment and capacity
- Meet Me Centers (MMC)
 - Overview and specifications
 - MMC Host obligations

Contents

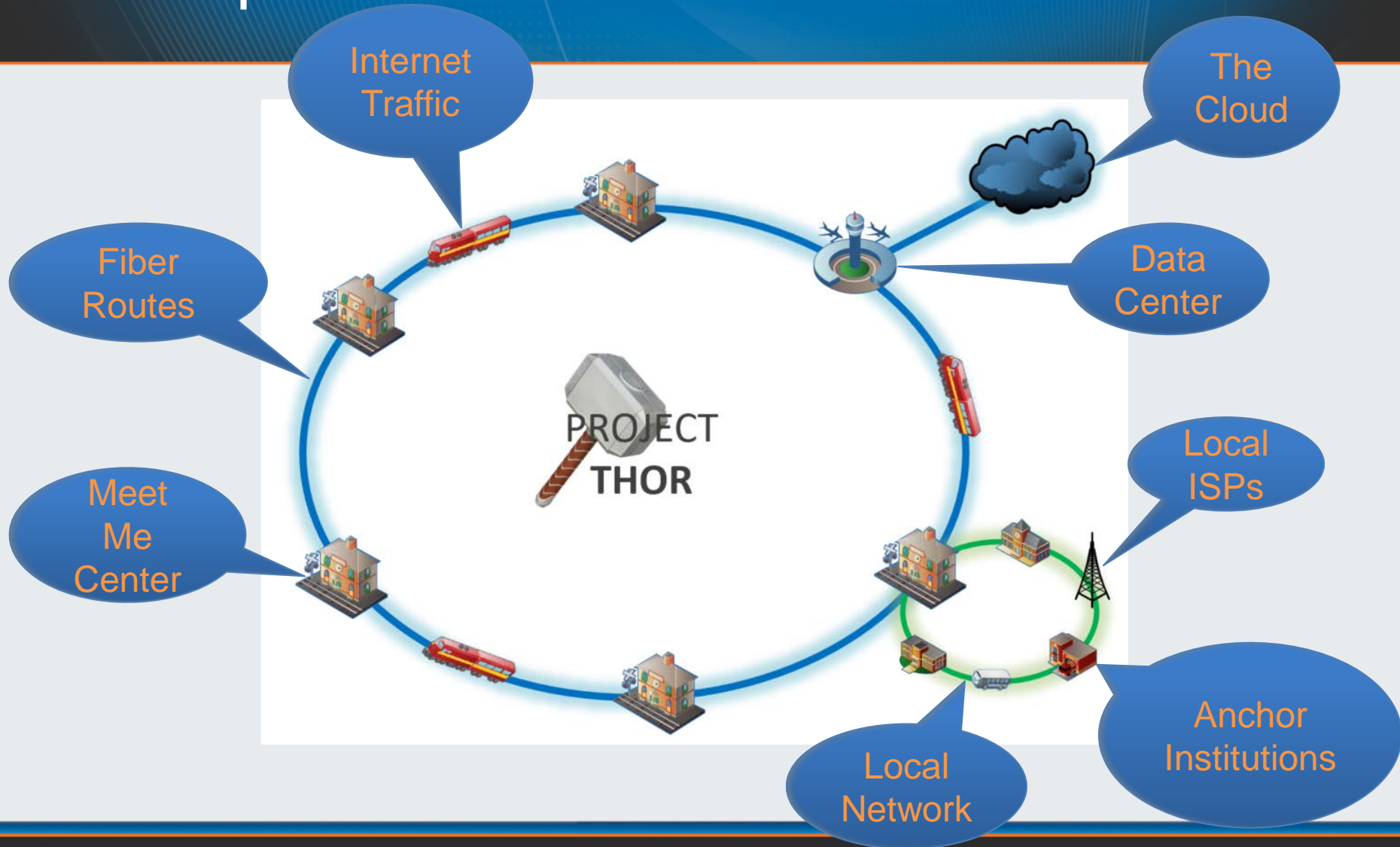
- Costs
 - Non Recurring Charges
 - Network Establishment Project
 - CDOT Fiber IRU Project
 - Local MMC Build Project
 - MMC Fiber Connectivity Project
 - Monthly Recurring Costs for Network Operations
 - Additional/Variable costs
- Revenues
 - Suggested revenue models for MMC hosts
 - Examples

OVERVIEW

What Is Project THOR?

- Middle Mile Regional Transport Network
 - Provide lower cost, aggregated bandwidth to communities
 - Resilient (self-healing) network for communities that do not currently have alternate paths
 - Alternative to existing carriers, enabling community broadband initiatives

Concept



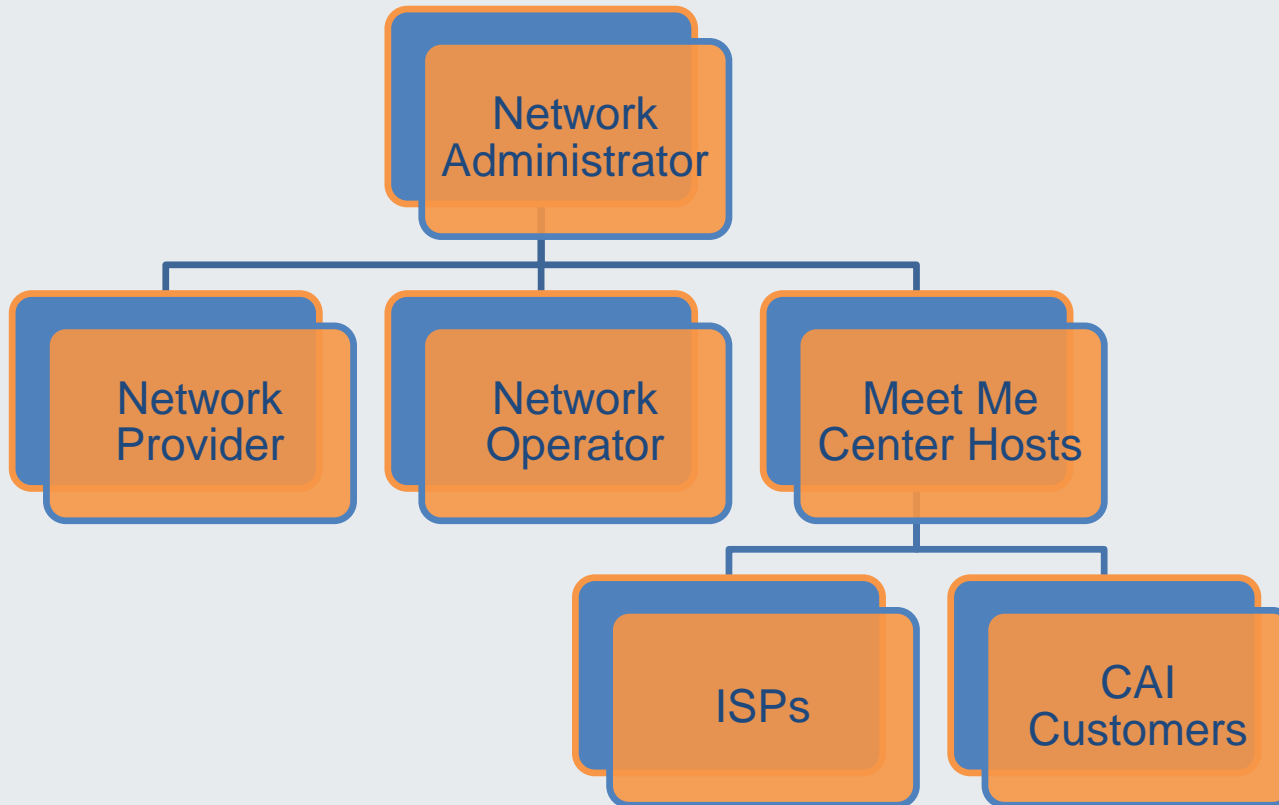
The Big Picture



Benefits

- **Resilient middle-mile network:** Primary and secondary pathway to each Meet Me Center
- **Buying power:** Aggregation of demand lowers costs to participating community anchors and ISPs
- **Open access:** ISPs and community anchors can access resilient and competitively priced service at Meet Me Centers
- **Leverage:** By joining Project THOR, communities can better leverage grant and local dollars

Roles



Mammoth's Role

- Currently developing “Blueprint” or Tactical Plan
 - Network Design
 - Financial Model
 - Costs
 - Revenues
 - Focus on long-term sustainability
- Network Provider for some segments of the network
- Network Operator

Network Administrator: NWCCOG

- Sets Project THOR policies and pricing
- Convenes Steering Committee as needed
- Procures transport and services from Network Providers
- Re-sells service to Meet Me Center Hosts at a rate including the cost of service and network operations
 - **One contract per location - NWCCOG does not service anchors individually**
- Contracts with Network Operator to manage administration and operations on behalf of NWCCOG
- Plans for future expansions

Network Providers (Carriers):

- Building blocks of the network
 - Dark fiber
 - Circuits (Ethernet, Wave, etc.)
 - Internet bandwidth
 - Value added services (Voice, video, etc.)
- Contract with NWCCOG
 - Industry-standard SLAs
- Drop off services at Meet Me Centers or Data Center
- **Multiple Network Providers will be assembled to create project THOR**

Network Operator: Mammoth Networks

- Contracts with NWCCOG to manage Project THOR operations:
 - Provides technical operations for the network
 - Provisioning and network configuration of equipment
 - Monitoring and network performance
 - Troubleshooting and warranty administration of equipment
 - Backup configurations and network security
 - Provides technical support to Meet Me Center hosts
 - After hours call center, troubleshooting
 - Coordination with Network Providers, and ISPs
 - On-site repairs and technical assistance if required
 - Works with NWCCOG on strategic planning network expansion efforts

Network Operator: Mammoth Networks

...Continued

- Provides administrative functions for Project THOR
 - Manages NWCCOG contracts with Network Providers, including coordination of Meet Me Center connections
 - Prepares and manages contracts for Meet Me Center Hosts
 - Participates in NWCCOG Broadband Steering Committee and Board meetings as needed, up to 6 meetings per year.
- Provides accounting and reporting functions for THOR
 - Conducts invoicing of Meet Me Center Hosts (one per Meet Me Center)
 - Maintains Project THOR financial records and reports
 - Serves as customer liaison for NWCCOG Meet Me Center contract and MMC service issues

Network Operator: Mammoth Networks

...Continued

- Markets and promotes the THOR Network
 - Staff sales engineer to work THOR deals
- Wholesale services across the THOR Network
 - Existing Mammoth customers
 - New carriers and ISPs
 - Cellular carriers

Meet Me Center Hosts: Community Anchors Or Consortia

- Contract with NWCCOG to purchase service
- Provide MMC Facilities per Project THOR standards
 - Design specifications: power, access/security, climate-control, racks, etc.
 - Open Access: available to ISPs and Community Anchor Institutions
- Coordinate community connections to Meet Me Centers
 - Funding of fiber or wireless connections to Meet Me Centers determined locally - not included in Project THOR service pricing
- Re-sell service to ISPs and Community Anchor Institutions
 - Prepare contracts and manage billing and customer service

ISPs & Anchor Institutions

- Provide services to end users
- Purchase network services and bandwidth from MMC Hosts
- Extend services throughout the community

NETWORK DESIGN

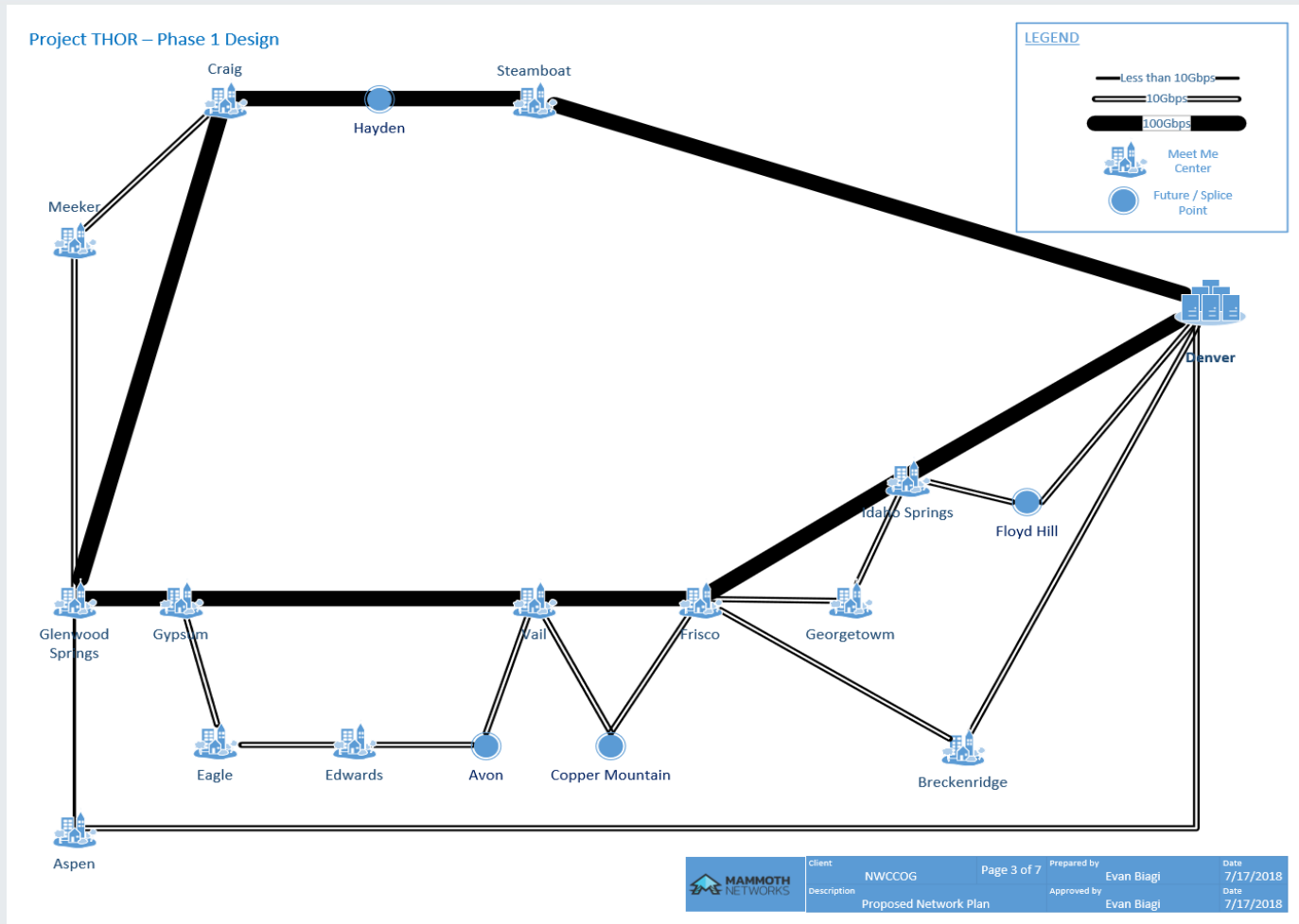
Building Blocks

- Network will be built using the following elements:
 - Dark Fiber
 - IRU from CDOT
 - Lit Services
 - 1G, 10G and 100G Waves using CenturyLink Fiber
 - 100G Ethernet from Mammoth Networks
 - Licensed Microwave (Aspen)
 - Ethernet and Wave services from other carriers as THOR expands

Design Considerations

- Availability of network assets in each community
- Anticipated demand based on population and/or market research
- Proximity of network assets to MMC
 - Phase 1 - time to implement

The Details: Design – by bandwidth



MEET ME CENTERS

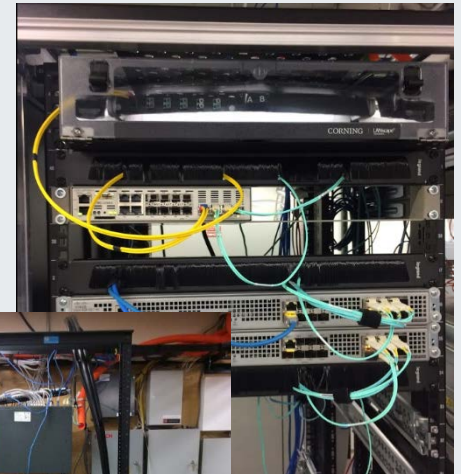
The Details: Meet Me Centers

- Location in each community where THOR network terminates
- Physical infrastructure to include:
 - Space for 2 racks minimum
 - Entrance conduits
 - HVAC
 - Access control 24/7
 - 40Amp, 120VAC Power with UPS/Generator
 - Roof space
 - Land use/easements/lease

Meet Me Center Classifications

| Classification | Network Transport |
|----------------|-------------------|
| Class 1 | 100G x 100G |
| Class 2 | 100G x 10G |
| Class 3 | 10G x 10G |
| Class 4 | 10G x 1G |
| Class 5 | 1G x 1G |

Meet Me Center Examples

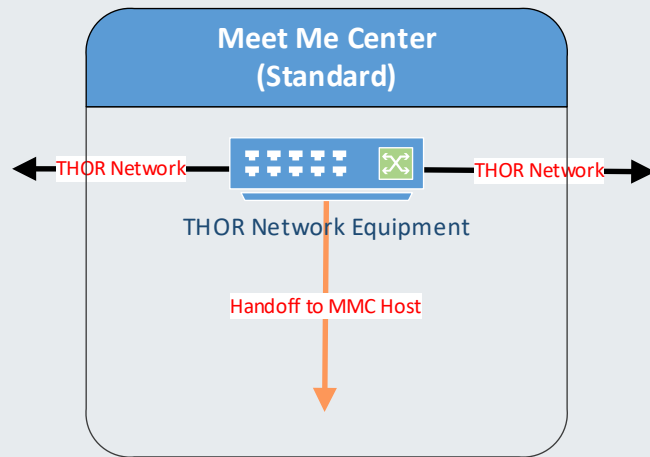


Connectivity at each MMC

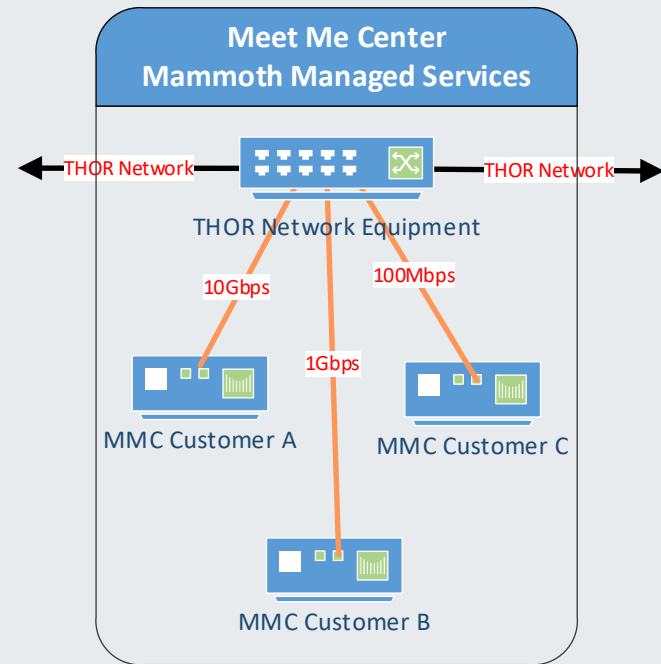
- NWCCOG default connectivity is for a single connection at each MMC to the MMC Host
- Mammoth Networks as the Network Operator will make available at each MMC a Managed Meet Me Center Services option to allow for multiple handoffs.
 - Option for 10Gbps or 1Gbps physical port
 - Each handoff can be traffic shaped based on end user
 - CPE required for each connection
 - Connection to each CPE monitored and supported

Connectivity at each MMC

STANDARD MMC



MAMMOTH MANAGED MMC SERVICES



COST ANALYSIS

Project THOR Cost Allocations

- Total fees are combination of Monthly Recurring Charges (MRC) and Non-Recurring Charges (NRC)
- Use point system to allocate costs across different classifications of MMCs.

| MMC Classification | Capacity | Points |
|---------------------------|-----------------|---------------|
| Class 1 | 100G x 100G | 100 |
| Class 2 | 100G x 10G | 90 |
| Class 3 | 10G x 10G | 80 |
| Class 4 | 10G x 1G | 70 |
| Class 5 | 1G x 1G | 60 |

Project THOR Cost Allocations

Non-Recurring Charges (NRCs) are divided into 4 Projects

- **Project #1: Project THOR Network “loop” Establishment Project (NEP)**
- **Project #2: Project THOR CDOT Fiber Lease Agreement Project (CFLAP)**
- **Project #3: Project THOR Bundled Local Meet-Me-Center Build Projects (LMMCP)**
- **Project #4: Project THOR Bundled Local Fiber Connections Build Projects (LFCP)**

Project THOR Cost Allocations

3 models used for allocating CDOT Dark Fiber IRU costs across all entities for purposes of DOLA grant application:

- **Option 1**

- Does not take into consideration DOLA funding for the CDOT IRU
- Results in higher Monthly Recurring Charges for each MMC Host

- **Option 2**

- Requests DOLA funding for 3 yrs. of CDOT IRU
- Results in 2yrs. of reduced MRCs for MMC Hosts. Year 3 will be collected to pay for the following year in advance.

- **Option 3**

- Requests DOLA funding for 10 yrs. of CDOT IRU
- Results in longer term cost reduction of MRCs
- Significantly higher match required from all MMC Hosts

Network Establishment Fees (NEP)

- Network Establishment Fees include
 - Equipment for core THOR Network
 - Mammoth evaluated 5 vendors
 - Pricing presented is based on Ciena
 - Fiber splicing and handhole placement on CDOT fiber route
 - Installation fees per MMC
 - Non Recurring fees for lit services

Local Meet Me Center Build Projects (LMMCP)

- Fees associated with infrastructure and improvements to create suitable Meet Me Center facilities
- Not every MMC will require funding
- Funding for Craig/Moffat, and Clear Creek County are included in independent DOLA applications, and not bundled with THOR DOLA request

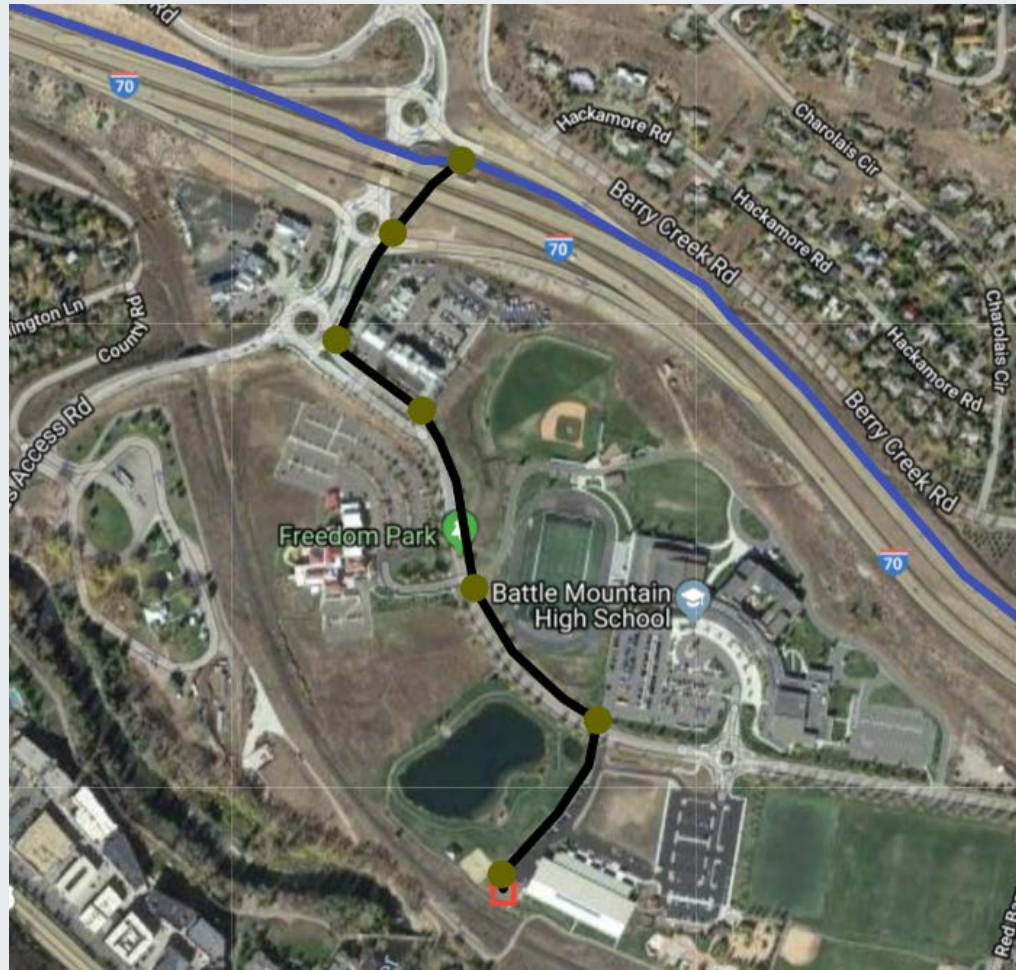
Local Meet Me Center Build Projects (LMMCP)

| MMC Host | LMMCP |
|------------------------------|---------------------|
| City of Aspen | \$0.00 |
| City of Craig | \$0.00 |
| Town of Eagle | \$93,592.34 |
| Eagle County | \$143,457.14 |
| Clear Creek County | \$0.00 |
| Summit County | \$0.00 |
| City of Glenwood Springs | \$85,020.00 |
| Rio Blanco County | \$0.00 |
| Northwest Colorado Broadband | \$0.00 |
| Town of Gypsum | \$93,592.34 |
| Town of Vail | \$0.00 |
| Totals | \$415,661.83 |

Local Fiber Connectivity Build Projects (LFCP)

- Fees associated with fiber connectivity from MMC to fiber infrastructure
- Not every MMC will require funding
- Fiber infrastructure built, can be further leveraged on a local basis to interconnect anchor institutions

Fiber Build – Edwards



Fiber Build – Eagle



Fiber Build – Gypsum



Local Fiber Connectivity Build Projects (LFCP)

| MMC Host | LFCP |
|------------------------------|---------------------|
| City of Aspen | \$0.00 |
| City of Craig | \$0.00 |
| Town of Eagle | \$180,268.97 |
| Eagle County | \$274,322.91 |
| Clear Creek County | \$0.00 |
| Summit County | \$0.00 |
| City of Glenwood Springs | \$19,471.40 |
| Rio Blanco County | \$0.00 |
| Northwest Colorado Broadband | \$0.00 |
| Town of Gypsum | \$340,609.84 |
| Town of Vail | \$0.00 |
| Totals | \$814,673.12 |

Project THOR MRCs

- Monthly Recurring Charges (MRCs) include:
 - Circuit Fees for underlying network elements
 - Network Operator Fees
 - Collocation fees and Cross Connects

- Options 1 & 2 include CDOT IRU fees
 - Option 2's cost reduction would only be recognized for the first two years, then it will revert to the same as in Option 1.

Project THOR MRCs

- Network Operator Fees are determined by classification of the MMC

| MMC Classification | Network Operator Fees |
|---------------------------|------------------------------|
| Class 1 | \$1200 |
| Class 2 | \$1000 |
| Class 3 | \$800 |
| Class 4 | \$700 |
| Class 5 | \$600 |

Project THOR MRCs

| | Option 1 | Option 2 | Option 3 |
|------------------------------|--------------------|------------------------|--------------------|
| <u>MMC Host</u> | <u>MRC</u> | <u>1&2 Yr. MRC</u> | <u>10Yr MRC</u> |
| City of Aspen | \$5,049.13 | \$4,458.70 | \$4,458.70 |
| City of Craig | \$7,413.04 | \$6,569.57 | \$6,569.57 |
| Town of Eagle | \$5,770.43 | \$5,095.65 | \$5,095.65 |
| Eagle County | \$5,770.43 | \$5,095.65 | \$5,095.65 |
| Clear Creek County | \$11,540.87 | \$10,191.30 | \$10,191.30 |
| Summit County | \$13,183.48 | \$11,665.22 | \$11,665.22 |
| City of Glenwood Springs | \$7,413.04 | \$6,569.57 | \$6,569.57 |
| Rio Blanco County | \$5,770.43 | \$5,095.65 | \$5,095.65 |
| Northwest Colorado Broadband | \$7,413.04 | \$6,569.57 | \$6,569.57 |
| Town of Gypsum | \$7,413.04 | \$6,569.57 | \$6,569.57 |
| Town of Vail | \$7,413.04 | \$6,569.57 | \$6,569.57 |
| Totals | \$84,150.00 | \$74,450.00 | \$74,450.00 |

Costs include Network Operator Fees

Option 2 fees are only valid for years 1 & 2. (fees would increase to rates shown in Option 1 for year 3)

Variable Costs

- Cost previously described are for establishment and operations of the core NWCCOG Network.
- Additional variable costs will be incurred for additional services including:
 - Dedicated Internet Access
 - Network Transport
 - Managed MMC Services

Dedicated Internet Access Costs

- Mammoth will offer Dedicated Internet Access (IP) at rates aggregated across all THOR MMCs
- Rates reduced at each tier
- Mammoth's IP Blend in Denver
 - Includes direct peer with Apple, Google, Microsoft, Netflix, & More

| IP Transit Tier | | | MRC Price / Mbps |
|-----------------|----|---------|------------------|
| 1Gbps | to | 2Gbps | \$0.75 |
| 2Gbps | to | 5Gbps | \$0.70 |
| 5Gbps | to | 10Gbps | \$0.60 |
| 10Gbps | to | 15Gbps | \$0.50 |
| 15Gbps | to | 20Gbps | \$0.48 |
| 20Gbps | to | 30Gbps | \$0.45 |
| 30Gbps | to | 40Gbps | \$0.40 |
| 40Gbps | to | 50Gbps | \$0.35 |
| 50Gbps | to | 60Gbps | \$0.33 |
| 60Gbps | to | 70Gbps | \$0.30 |
| 70Gbps | to | 80Gbps | \$0.28 |
| 80Gbps | to | 90Gbps | \$0.26 |
| 90Gbps | to | 100Gbps | \$0.25 |

Transport Only Costs

- Private Line Services
 - MMC to MMC
 - MMC to 910T
- Can be used by ISPs who have their own IP services in Denver
- Cross Connect required at 910 15th Street, Denver

IP Transport Only

\$.10/Mbps

Mammoth Managed MMC Services

- Simplifies aggregation of local Anchor Institutions at a MMC
- Reduces need for Local Network Operator in some cases

| Connection Type | MRC | NRC |
|-----------------------------------|-------|-------|
| Up to 1Gbps | \$100 | \$250 |
| Up to 10Gbps | \$225 | \$250 |
| Includes CPE at customer location | | |

Additional anticipated savings

- As network continues to expand, and communities use more bandwidth, additional cost savings will be realized
- At current assumptions, communities using over 10Gbps will have total cost per Mbps under \$1.00
 - Average Cost per Mbps across all communities is \$1.89 using Phase 1 assumptions

Meet Me Center Revenues

- It is expected that each MMC will service Community Anchor Institutions, and local Internet Service Providers
- Each MMC can offer different products, including:
 - Collocation space (if available)
 - Dedicated Internet Access
 - Network Transport to Denver, or another MMC
 - Local dark fiber leases or IRUs (if applicable)

MSRP Rates

- Rates can be determined by each MMC Host, but NWCCOG has recommended rates to keep consistency across all THOR participants.
- These rates are referred to as MSRP Rates

MSRP – Dedicated Internet Access

DIA

Dedicated Internet Access

| Speed | | MRC | NRC |
|-------|-------|------------|----------|
| Down | Up | | |
| 100 | 100 | \$350.00 | \$250.00 |
| 500 | 500 | \$750.00 | \$250.00 |
| 1000 | 1000 | \$1,500.00 | \$250.00 |
| 2000 | 2000 | \$2,500.00 | \$250.00 |
| 5000 | 5000 | \$4,500.00 | \$250.00 |
| 10000 | 10000 | \$8,000.00 | \$250.00 |

THOR Wholesale

DIA

Expected THOR Rate

\$
0.30 /Mbps

| MRC | Margin |
|---------|------------|
| \$30 | \$320.00 |
| \$150 | \$600.00 |
| \$300 | \$1,200.00 |
| \$600 | \$1,900.00 |
| \$1,500 | \$3,000.00 |
| \$3,000 | \$5,000.00 |

MSRP – Network Transport

Network Transport

THOR Locations

| | | | |
|-------------------|-----------|------------|------------|
| Network Transport | | 0.25 /Mbps | |
| Port | | | |
| <u>Down</u> | <u>Up</u> | <u>MRC</u> | <u>NRC</u> |
| 100 | 100 | \$100.00 | \$250.00 |
| 1000 | 1000 | \$200.00 | \$250.00 |
| 10000 | 10000 | \$500.00 | \$250.00 |

THOR Wholesale Network Transport

Expected THOR

Rate

\$
0.10 /Mbps

| | |
|------------|---------------|
| <u>MRC</u> | <u>Margin</u> |
| \$10 | \$15.00 |
| \$100 | \$150.00 |
| \$1,000 | \$1,500.00 |

MRC Cost Summary – NCB Example

| Item | MRC Cost |
|-----------------------------|-----------------|
| THOR MMC Fees – Class 1 MMC | \$7413 |
| Dedicated Internet Access | |
| Routt County @ 300Mbps | \$90 |
| City of Steamboat @ 300Mbps | \$90 |
| SSSD @ 1Gbps | \$300 |
| YVEA @ 300Mbps | \$90 |
| UC Health at 5Gbps | \$1500 |
| Mammoth Managed MMC | |
| 1G Handoffs x 4 | \$400 |
| 10G Handoffs x 1 | \$225 |
| TOTAL | \$10,108 |

- Current NCB fees are \$10,965/month.
- Represents an 8% cost savings with 10x more capacity for growth!



QUESTIONS AND COMMENTS?

For more information, please contact:

Evan Biagi at 970.457.1050 or ebiagi@mammothnetworks.com
Nate Walowitz at 970.406.0252 or nwalowitz@nwccog.org

Overview

Project THOR is an effort by the Northwest Colorado Council of Governments to assist County and Local governments to create a resilient regional Middle-Mile Transport Network. Funded initially through the budgets of Northwest Colorado counties and an inaugural group of local towns and cities, the NWCCOG broadband project will work with multiple existing broadband providers to create a broadband transport network that creates a network that will deliver abundant, reliable, and lower costs to the entire region. The network will be created leveraging the needs of local governments, pre-K, K-12 schools, colleges, health care facilities, public safety, as well as state and federal agencies. It is envisioned that the network will be available to local and middle mile broadband providers to make the benefits of the Project THOR network to private businesses and consumers.

Beyond delivering an abundance of reliability of broadband and low cost bandwidth, the Network has the potential to enhance competition throughout the region and lower consumer and business broadband prices.

To support network participants needs NWCCOG will enter into an arrangement with a Network Operator to deliver network connection data circuits and manage the network to ensure Project THOR objectives are met. NWCCOG will be the Network Administrator and will also serve as the Network Owner for the CDOT fiber strands and infrastructure that is IRU'd (leased) from CDOT.

Project THOR has also been shared with Clear Creek County, Garfield County, Region 10, Park County and SWCCOG to potentially support their needs for resilient and lower cost broadband transport and services in the not too distant future.

Network Design

The Project THOR middle mile network will be created by combining the following physical network elements to create the regional loop architecture.

- CDOT owned (NWCCOG leased) dark fiber from Denver to Glenwood Springs and Frisco to Breckenridge, managed by the Network Operator,
- Lit services and physical network circuits from CenturyLink and Mammoth Networks. All lit services will be procured and managed by the Network Operator,
- All network routing hardware will be owned by NWCCOG Project THOR and provided by Ciena, based on competitive bid and technical requirements by the Network Operator.

Local connections through Meet Me Centers and connections to the Project THOR network.

- Meet Me Center specifications provided to each jurisdiction by NWCCOG through Network Operator,
- Fiber connection between Meet Me Center and nearest Project THOR network Point of Presence.

Key Features

1. Network Administrator (NWCCOG) works with contracted Network Operator (Mammoth Networks) to manage existing circuits provided by the Network Operator and IRU'd CDOT fiber and infrastructure.
2. Network Administrator will serve as network owner for IRU's CDOT fiber and infrastructure.
3. Participants want an OSI Level 3 network.
4. Network security requirements will support NCIC, CJIS and State CBI data traffic needs.
5. What commercial/NGO users can we bring onto the network to expedite design and buildout costs?
6. Discounted bandwidth and transport can be provided at sub \$0.50 pricing based on aggregated procurement (below current market availability).
7. Transport pricing at \$0.50 for single source/single destination network users, excluding per port costs (below current market availability).
8. Governance models and agreements of how memberships in the coalition, beyond NWCCOG membership are in process.

Implementation and Delivery

Specifically the Northwest Colorado Regional Middle Mile Transport Network will provide the following in 2018 and 2019:

- Develop governance and funding models for the network
- Submit grant application to DOLA for 50% match funding
- Potentially leverage existing broadband wave connections using multiple routes
 - Fiber to Denver IXC using CDOT fiber from Glenwood Springs to Denver
 - Fiber to Denver alternate path partially using fiber along BNSF tracks
 - Fiber connecting to Grand Junction (and beyond)
- Provide geographic redundancy to the Internet IXC in Denver
- Future connection to other IXCs leveraging Region 10's network fiber
- Plan for multiple regional data center locations to provide alternative, off-site data storage services to local governments
- Leverage incumbent broadband and electric services providers
- Design the network to ensure dynamic traffic management and routing to ensure reliability
- Design and build out new fiber optic network paths to bridge gaps as necessary to ensure abundant broadband access throughout the region

- Partner with existing and new providers to help support expansion of broadband deployment to consumers and businesses in the most remote areas across the region
 - Lower the cost of transport
 - Lower the cost of bandwidth
 - Allow resilient to avoid broadband and access outages
- Maintain and enhance economic development by using the Network's lower costs to support profitable rural broadband deployment to more rural areas, reduced pricing, improved reliability, increased broadband speeds to consumers and businesses

Project Phases

Phase 1 Network and Participants

Network Elements

- CDOT dark fiber
- CenturyLink Lit Services
- Mammoth Networks Ethernet Services
- Local Fiber from Project THOR PoP to MMCs

Network MMC Locations and Managing Jurisdiction

- Denver – NWCCOG
- Idaho Springs – Clear Creek County
- Georgetown – Clear Creek County
- Frisco – Summit County
- Breckenridge – Summit County
- Vail – Town of Vail
- Edwards – Eagle County
- Eagle – Town of Eagle
- Gypsum – Town of Gypsum
- Glenwood Springs – City of Glenwood Springs
- Aspen – City of Aspen
- Meeker – Rio Blanco County
- Craig - City of Craig/Moffat County
- Steamboat Springs – Northwest Colorado Broadband

Phase 2 – Potential Network Elements

- CDOT dark fiber
- CenturyLink Lit Services
- Mountain Parks Electric dark fiber
- Mammoth Networks Ethernet Services
- Local Fiber from Project THOR PoP to MMCs

Potential Additional Network MMC Locations and Managing Jurisdiction

- Avon – Town of Avon
- Floyd Hill – Clear Creek County
- Fraser – Grand County
- Grand Junction – Region 10
- Hayden – Northwest Colorado Broadband
- Kremmling – Grand County
- Leadville – Town of Leadville

Project THOR Proposed Network Costs and Recommended Regional MMC Pricing

- Project THOR pricing will be made available to any provider, CAI, private business or individual that connect to an MMC by new dedicated fiber or leveraging local existing fiber between their location and the Meet Me Center. Our region is being transparent to demonstrate a free and open market.

Network Transport THOR Locations

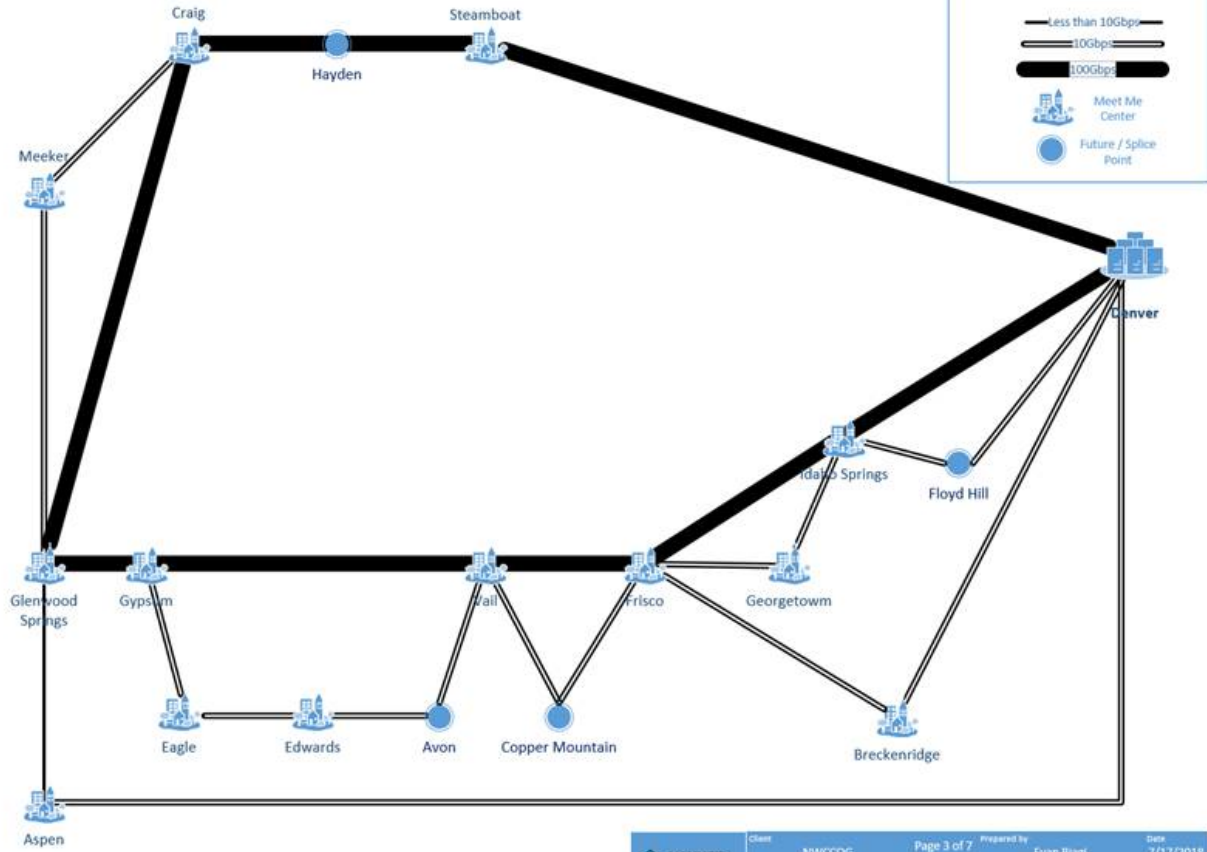
| Network Transport | | 0.25 /Mbps | |
|-------------------|-------|------------|----------|
| Port | | MRC | NRC |
| Down | Up | | |
| 100 | 100 | \$100.00 | \$250.00 |
| 1000 | 1000 | \$200.00 | \$250.00 |
| 10000 | 10000 | \$500.00 | \$250.00 |

DIA Dedicated Internet Access

| Speed | | MRC | NRC |
|-------|-------|------------|----------|
| Down | Up | | |
| 100 | 100 | \$350.00 | \$250.00 |
| 500 | 500 | \$750.00 | \$250.00 |
| 1000 | 1000 | \$1,500.00 | \$250.00 |
| 2000 | 2000 | \$2,500.00 | \$250.00 |
| 5000 | 5000 | \$4,500.00 | \$250.00 |
| 10000 | 10000 | \$8,000.00 | \$250.00 |

Project THOR Network Map

Project THOR – Phase 1 Design





June 20, 2018

MEMBER JURISDICTIONS

City of Glenwood Springs

City of Steamboat Springs

EAGLE COUNTY

Avon
Basalt
Eagle
Gypsum
Minturn
Red Cliff
Vail

GRAND COUNTY

Fraser
Granby
Grand Lake
Hot Sulphur Springs
Kremmling
Winter Park

JACKSON COUNTY

Walden

PITKIN COUNTY

Aspen
Snowmass Village

SUMMIT COUNTY

Breckenridge
Blue River
Dillon
Frisco
Montezuma

Name
Jurisdiction
Address
Address

Name,

Action requested by July 9th, 2018: sign this Letter of Intent (LOI) on behalf of your jurisdiction to confirm financial participation in Project THOR, a regional middle-mile broadband network brought to you by Northwest Colorado Council of Governments Broadband program.

A cooperative cost model was presented on June 13, 2018 at the Mountain Connect Conference by Mammoth Networks. For specific information from that presentation, refer to the Project THOR Mtn Connect 061018 JB.pptx document (Power Point presentation) sent separately to each jurisdiction's Project THOR contact. That PPT document is a Confidential work product while this LOI is public. Please contact the NWCCOG Broadband Director, Nate Walowitz for additional information.

Signing this LOI on behalf of your jurisdiction will allow Northwest Colorado Council of Governments (Network Administrator) to finalize Meet-Me-Center Hosts (MMCH) participation in Phase 1 of Project THOR, and coordinate with Mammoth Networks (Network Operator) to lock in FINAL a.) network design, b.) financial model (cost shares), and c) network build costs, and d) sign contracts for equipment and transport.

With this LOI, NWCCOG will submit a DOLA grant application by August 1 for eligible Non-Recurring Costs (NRC) for network establishment that are directly associated with the overall network. Also, in the same submittal to DOLA, each local MMC host jurisdiction can submit for costs of the local MMC and as well as estimated costs for fiber builds from THOR drop point to each MMC to be included in the grant application. These latter costs (MMC and fiber build) are the responsibility of the local jurisdiction. If funds are awarded by DOLA for these, it will require a 50% local match.

Recurring Costs noted in this LOI are estimated based on prior verbally committed participation in Project THOR by the contact person for the jurisdiction for Project THOR, and as researched by the Network Operator. For further detail on the estimated cost of connection to Project THOR for your jurisdiction, contact the NWCCOG Broadband Director.

Meet Me Center Host (MMCH) entities fall into 5 “classes” by the bandwidth on each “side” of their MMC. Actual cost for local fiber build to a specific MMCH location varies with distance from the network drop point, and by how much of the MMC infrastructure at that location already exists. Estimated Non-Recurring costs (NRC) of MMC locations to range from \$35,000 for Class 5 to \$60,000 for Class 1. For detailed estimated costs of your specific MMC location, contact NWCCOG Broadband Director.

Your MMC Location in XXXX is a Class X Location.

Your local responsibility of the total estimated Non-Recurring Cost (NRC) for network establishment for Project THOR is \$XXXX. This is your portion of NRC for the Project THOR network infrastructure. This NRC does not include the cost of constructing your local MMC or the estimated cost of fiber connection from Project THOR your drop point to MMC.

Monthly Recurring Cost (MRC) to MMCH jurisdictions is based on the Specific Class (1-5) of the MMC, on participation by all verbally committed MMCH jurisdictions, on tentative pricing of Network Transport Components including quotes from carriers and CDOT and equipment vendor quotes attained by Mammoth Networks, on monthly costs related to transport of the entire Project THOR network.

Your total estimated total Monthly-Recurring Cost (MRC) is \$XXXX. Please budget for this Monthly Recurring Costs (MRC) for Transport to begin January 1, 2019.

By signing this LOI the jurisdiction is:

- a. committing to construct a Meet-Me-Center per Project THOR network specifications, or dedicate equivalent space in an already constructed MMC
- b. identify the location of local Meet-Me-Center by July 9th
- c. committing to pay the cost of bringing fiber from a designated drop point on the Project THOR “loop” to your MMC location
- d. committing to enter into a Contract with NWCCOG by December 31, 2018 for MRC, for use of that MMC location, for use of DOLA matching funds for network NRC (and local NRC if awarded), and for access to the Project THOR network as billed.
- e. Committing to budget in 2019 for a, b, c and d, above.

Identify Location of Meet Me Center building _____

Address _____

NWCCOG hereby commits through this Letter of Intent, to deliver Project THOR on behalf of the region in good faith within the timeline and terms presented, to seek as many participants as possible (and is reasonable given network design) to act as Network Administrator on behalf of the NWCCOG membership and Partner Jurisdictions (paying Project THOR connections outside NWCCOG membership region), and to work closely with the contracted Network Operator to deliver a reliable, resilient and affordable open Middle Mile Network to local entities for their benefit, signed:

Jon Stavney, Executive Director NWCCOG

Date

On behalf of _____ (jurisdiction), I commit to the terms outlined above including Project Non-Recurring Costs, and Monthly Recurring Costs. These will be billed starting in January 2019.

Name

Title

Date

FIBER LEASE AGREEMENT
Non-Exclusive Access to Selected Highway Rights-of-Way (ROW) and
Use of Existing Dark Single-Mode Fiber Optic Strands on
Selected Corridors in Exchange for an Annual Lease Payment

THIS LEASE AGREEMENT ("this Lease Agreement") is entered into this _____ day of _____, 2018 by and between the State of Colorado for the use and benefit of the Colorado Department of Transportation, hereinafter referred to as "CDOT" or "Lessor", and the Northwest Colorado Council of Governments, hereinafter referred to as "NWCCOG" or Lessee". Lessor and Lessee also may be hereinafter referred to individually as "Party" or jointly as the "Parties".

CDOT owns and operates traffic devices, infrastructure and fiber optic telecommunications backbone cable statewide (collectively "Intelligent Transportation Systems") to provide reliable, accurate and timely statewide traveler information so that users are able to make decisions that enhance and improve their choice of travel, mode, route and time, thereby resulting in a more productive, efficient and safe transportation system. CDOT believes, and studies have demonstrated, that travelers that utilize traveler information can benefit by avoiding traffic problems, saving time by reducing delay and improving travel reliability, reducing travel frustration, reducing crash rates and reducing fuel consumption.

NWCCOG is a voluntary association serving 21 municipal and 5 county governments that, individually and collectively, believe working together on a regional basis provides benefits that could not be obtained alone. Representatives from each municipal and county jurisdiction direct the activities of NWCCOG. NWCCOG completed a Regional Strategic Plan for Broadband that will be used as a blueprint to significantly improve broadband capacity, reliability and cost for the northwest corner of the state, and believes that leasing the fiber strands as identified in this Lease Agreement will help to facilitate implementation of the NWCCOG Regional Strategic Plan.

CDOT, in its sole discretion, may make capacity on its statewide fiber optic telecommunications backbone cable available in accordance with authorized purposes and use to other State of Colorado governmental agencies, including institutions of higher education, or political subdivisions provided that such capacity on the statewide fiber optic telecommunications backbone cable shall not be used, in any manner whatsoever, by State of Colorado governmental agencies, including institutions of higher education, or political subdivisions to generate any profit including providing or subleasing such capacity on the statewide fiber optic telecommunications backbone cable for commercial telecommunications purposes.

NOW, THEREFORE, in consideration of the mutual promises contained herein and other good and valuable consideration, the Parties hereto agree as follows:

1. PREMISES. Lessor owns and controls a statewide fiber optic telecommunications backbone cable ("the Fiber Backbone") located within the public State Highway Rights-of-Way (ROW). Lessor desires to grant non-exclusive access to selected public State Highway ROW to Lessee and lease to Lessee existing specified dark single-mode fiber optic telecommunications strands ("the Lessee Fiber Strands") located within the Fiber Backbone along the following public State Highway ROW (collectively "the Corridors") as follows:

(a) Four (4) Lessee Fiber Strands on I-70 from Glenwood Springs at approximately mile point 116.4 to Vail at approximately mile point 176.1, and

(b) Four (4) Lessee Fiber Strands on I-70 from Vail at approximately mile point 176.1 to C-470 at approximately mile point 259.8, and

(c) Four (4) Lessee Fiber Strands on I-70 from C-470 at approximately mile point 259.8 to I-25 at approximately mile point 274.1, and

(d) Four (4) Lessee Fiber Strands on I-25 from I-70 at approximately mile point 210.3 to Colfax Ave at approximately mile point 213.2, and

(e) Four (4) Lessee Fiber Strands on SH 9 from road southwest (Riverpark Drive) at approximately mile point 86.0 to I-70 (Frisco) at approximately mile point 97.2.

2. LESSOR AND LESSEE INTEREST WITHIN THE CORRIDORS. Lessor's and Lessee's interests within the Fiber Backbone, the public State Highway ROW, the Corridors and the Lessee Fiber Strands shall be as follows:

(a) Lessor shall retain ownership of the Fiber Backbone in the Corridors, including the Lessee Fiber Strands. Lessor's lease of the Lessee Fiber Strands to Lessee is not meant to imply, either explicitly or implicitly, or confer any interest in real property, title, ownership or easement in the Fiber Backbone or in any public State Highway ROW or the Corridors whatsoever. Furthermore, Lessor's lease of the Lessee Fiber Strands to Lessee shall not establish a precedent, form a commitment or obligate Lessor in any manner whatsoever to lease to Lessee additional fiber optic telecommunications strands in the Fiber Backbone located within the public State Highway ROW or within the Corridors. Lessor makes no representations or promises, either implied or expressed, that the Fiber Backbone meets Lessee required functional specifications.

(b) Lessee shall retain ownership of any pull boxes, conduit, Lessee lateral fiber optic telecommunications cable and connectors and equipment (collectively "the Lessee Fiber Infrastructure") that Lessee installs and maintains within the Corridors to use and operate the Lessee Fiber Strands.

(c) Subject to the provisions of this Lease Agreement, including the annual lease payment set forth in Section 6 below (LEASE PAYMENT), Lessee shall have complete, unrestricted and exclusive right-to-use to the Lessee Fiber Strands; except that Lessee shall not use the Lessee Fiber Strands in any manner whatsoever to generate any profit including providing or subleasing such capacity on the Lessee Fiber Strands for commercial telecommunications purposes.

(d) Excluding the Lessee Fiber Strands, nothing in this Lease Agreement shall prevent, prohibit or impede Lessor, in its sole discretion and authority, from offering use of existing single-mode dark fiber optic telecommunications strands in the Fiber Backbone to third parties authorized and approved by Lessor.

(e) All warranties and representations of any kind with regard to the Lessee Fiber Strands are disclaimed by Lessor. Except as otherwise identified in this Lease Agreement, loss of use of the Lessee Fiber Strands does not relieve Lessee from any obligations assumed or required by this Lease Agreement, or from complete and proper fulfillment of the terms, conditions and provisions of this Lease Agreement, nor does it entitle Lessee to compensation for damages or loss which could be attributed to such loss of use. Notwithstanding the aforementioned, Lessor

agrees to provide initial Lessee Fiber Strands that are functionally operational and in good working order. Lessee understands and acknowledges that functionally operational and good working order Lessee Fiber Strands can be impacted over time by normal wear and tear as well as other items beyond the control of Lessor for which Lessor shall have no responsibility and for which Lessee shall have no right to bring any claim against Lessor or seek compensation or damages from Lessor. If Lessee notifies Lessor regarding issues pertaining to functionally operational and good working order of the Lessee Fiber Strands Lessor agrees to work with Lessee to resolve such issues and to replace the Lessee Fiber Strands with existing fiber strands in the Fiber Backbone, if available, that are functionally operational and in good working order. In such case that no fiber strands exist in the Fiber Backbone that are functionally operational and in good working order the Parties agree to work together to resolve the situation in a manner acceptable to both Parties.

(f) The Parties agree to meet semi-annually to discuss any issues pertinent to this Lease Agreement including updating of contact information for the Parties personnel that perform day-to-day operations to facilitate email provisions identified in this Lease Agreement as well as administration and management of this Lease Agreement. Lessor representative identified in Section 21 below (NOTICE) will be primarily responsible, and will make reasonable attempts, to contact Lessee representative identified in Section 21 below (NOTICE) to schedule such annual meeting.

3. ACCESS TO THE CORRIDORS. Lessee shall have access to the Lessee Fiber Strands at any existing CDOT pull box, vault and/or manhole provided that Lessee receives written consent from Lessor prior to accessing the Lessee Fiber Strands at such existing CDOT pull box, vault and/or manhole and provided that Lessee complies with the requirements of Section 7 below (CONSTRUCTION BY LESSEE IN THE CORRIDORS) and with the requirements of Section 8 below (MAINTENANCE RESPONSIBILITIES IN THE CORRIDORS), as applicable, and as a condition prior to accessing Lessee Fiber Strands in the Corridors. In certain extraordinary situations, as determined solely by Lessor in its discretion, Lessor may allow Lessee to access the Lessee Fiber Strands at a location other than an existing CDOT pull box, vault and/or manhole; however, such permission by Lessor to allow Lessee to access the Lessee Fiber Strands at a location other than an existing CDOT pull box, vault and/or manhole shall not establish a precedent or obligate Lessor in any manner whatsoever to allow Lessee subsequent access to the Lessee Fiber Strands at a location other than an existing CDOT pull box, vault and/or manhole.

4. EFFECTIVE DATE. The Effective Date of this Lease Agreement shall be the date on which this Lease Agreement is signed by the Executive Director of the Colorado Department of Transportation, or his designee. If the Parties so desire, the term may be extended for a subsequent time period as identified in Section 5 below (TERM) and by written amendment as described in Section 29 below (MODIFICATION OF TERMS AND CONDITIONS) in this Lease Agreement. If the Parties decide not to renew this Lease Agreement Lessor, at its sole discretion and authority, may require Lessee to disconnect and remove the Lessee Fiber Infrastructure from the Corridors and restore the affected area to its condition prior to the beginning of this Lease Agreement, normal wear and tear excluded, at Lessee's sole cost and expense, no later than ninety (90) days following the termination date.

5. TERM. The initial term of this Lease Agreement shall be twenty (20) years, commencing on the Effective Date. This Lease Agreement may be renewed for another negotiable term upon the written agreement of both Parties at the lease rate current at the time that this Lease

Agreement is renewed. If Lessee does not seek another lease term, Lessee must give written notice, in accordance with and to the address identified in Section 21 below (NOTICE), to Lessor at least one (1) year prior to expiration of initial term; however, neither Party shall be obligated to enter into a subsequent term if the Parties cannot come to agreement on the terms and conditions of a renegotiated lease. If the Parties decide not to renew this Lease Agreement, Lessor shall immediately rescind grant to Lessee non-exclusive access to the Corridors and use and operation of the Lessee Fiber Strands in the Corridors and Lessor, at its sole discretion and authority, may require Lessee to disconnect and remove the Lessee Fiber Infrastructure and any Lessee-owned lateral fiber optic telecommunications cable from the Corridors and restore the affected area to its condition prior to the beginning of this Lease Agreement, normal wear and tear excluded, at Lessee's sole cost and expense, no later than ninety (90) days following the termination date. If Lessee refuses or fails to disconnect and remove the Lessee Fiber Infrastructure and all Lessee-owned lateral fiber optic telecommunications cable installed within the Corridors from the Corridors no later than ninety (90) days following the termination date, Lessor shall have the right to have the Lessee Fiber Infrastructure and all Lessee-owned lateral fiber optic telecommunications cable disconnected and removed from the Corridors at Lessee's sole expense.

6. LEASE PAYMENT. Lessee shall pay Lessor for the first year of the term described in Section 4 above (EFFECTIVE DATE) and Lessee shall pay Lessor an annual lease payment for each subsequent year of the term of this Lease Agreement. Lessee shall make the first year's Total Annual Lease Payment as shown on **Exhibit A, Northwest Colorado Council of Governments Lease Agreement Payment Table**, hereinafter referred to as ("**Exhibit A**"), which is attached hereto and incorporated herein, within thirty (30) days of the date that Lessor actually grants the Lessee Fiber Strands to Lessee. Lessee may pay the first year's Total Annual Lease Payment based on a prorated amount of the first year's annual lease payment corresponding from the date that Lessor actually grants the Lessee Fiber Strands to Lessee to the anniversary of the Effective Date. The annual lease payment shall automatically be increased by three percent (3%) each year after the first year. Lessee shall pay the Total Annual Lease Payment amount for each subsequent year of the Lease Agreement term as shown on **Exhibit A**. Subsequent Total Annual Lease Payments shall be made within thirty (30) days of the anniversary of the Effective Date. Payments shall be made payable to CDOT at:

Colorado Department of Transportation
C/o Accounting Receipts & Deposits
2829 West Howard Place
Denver, CO 80204

Or at such place as Lessor from time to time designates by notice as provided herein. In the event Lessor has not received the Total Annual Lease Payment hereunder within thirty (30) days after said payment becomes due and owing, a late charge of five percent (5%) of that Total Annual Lease Payment shall be assessed to Lessee. Both Lessor and Lessee agree that acceptance by Lessor of the late payment does not waive Lessor's right to declare Lessee in default of this Lease Agreement.

Lessor representative identified in Section 21 below (NOTICE) agrees to provide Lessee representative identified in Section 21 below (NOTICE) an invoice showing the Total Annual Lease Payment that corresponds to the Total Annual Lease Payment amount as shown on **Exhibit A** thirty (30) days prior to the annual lease payment due date, which is the anniversary of the Effective Date. Failure of Lessor representative identified in Section 21 below (NOTICE) to

provide Lessee representative identified in Section 21 below (NOTICE) such invoice as identified herein does not relieve Lessee from any obligations to pay the Total Annual Lease Payment and the late charge if applicable and to comply with all terms, conditions and provisions as identified in this Section 6 (LEASE PAYMENT).

The Total Lease Agreement Payment amount as shown on **Exhibit A** for the entire term of this Lease Agreement as identified in Section 5 above (TERM) shall be the maximum amount that Lessee shall pay to Lessor for the Lessee Fiber Strands, not including any allowable damages that have been demonstrated to be owed, provided that the Total Lease Agreement Payment amount as shown on **Exhibit A** is current and accurately reflects all Lessee Fiber Strands granted by Lessor to Lessee for the entire term of this Lease Agreement. Lessee shall not be financially responsible to pay Lessor for improving, replacing or relocating the Fiber Backbone in any State Highway ROW or in the Corridors except as otherwise specifically provided herein.

7. CONSTRUCTION BY LESSEE IN THE CORRIDORS. Regarding any work in the Corridors to install the Lessee Fiber Infrastructure or any other such work, Lessee or Lessee's contractor shall comply with CDOT's 2017 version of Standard Specifications for Road and Bridge Construction, as applicable, which can be accessed at the following web site: <http://www.coloradodot.info/business/designsupport/construction-specifications>, or as approved by Lessor. Prior to the commencement of any work in the Corridors to install the Lessee Fiber Infrastructure or any other such work, Lessee or Lessee's contractor shall prepare and provide construction plans ("the Lessee Fiber Infrastructure Plans") to Lessor in hard copy and appropriate electronic format for review, comment and approval prior to commencement of any construction in the Corridors. Lessor shall review and provide Lessee approval or comments within fifteen (15) business days after receipt of the Lessee Fiber Infrastructure Plans, and provide approval or comments within fifteen (15) business days after receipt of any subsequent plans submitted by Lessee that are required to facilitate installation or construction of the Lessee Fiber Infrastructure. Following Lessor approval of the Lessee Fiber Infrastructure Plans, but prior to the commencement of any work in the Corridors to install the Lessee Fiber Infrastructure or any other such work, Lessee or Lessee's contractor shall apply for and obtain the applicable CDOT Region Utility Permit, which authorizes construction within the Corridors, and comply with all applicable provisions, terms and conditions of said applicable CDOT Region Utility Permit. The applicable CDOT Region Utility Permit addresses, but is not limited to, the following requirements: insurance and bonding during construction, traffic control, worker safety, general construction provisions, environmental provisions, facility relocation procedures, maintenance roles and responsibilities, and access to the Corridors. Lessor shall waive any and all associated fees and costs of said applicable CDOT Region Utility Permit. Lessor shall not unreasonably withhold or delay issuance of the applicable CDOT Region Utility Permit, and in any event shall issue said applicable CDOT Region Utility Permit within forty-five (45) days of receiving Lessee's properly completed application provided that no mitigating circumstances, requirements, clearances or other issues must be addressed thereby making issuance of said applicable CDOT Region Utility Permit not possible within forty-five (45) days. Lessee or Lessee's contractor or subcontractor shall perform all work in Corridors so as not to cause damage to the Fiber Backbone or Lessor equipment within the Corridors. Lessee or Lessee's contractor shall be solely responsible to remedy any and all damage(s) to the Fiber Backbone or Lessor equipment within the Corridors caused as a direct result of negligence or improper or careless installation or construction of the Lessee Fiber Infrastructure, and Lessee or Lessee's contractor shall reimburse Lessor for any and all cost to repair, replace and restore the Fiber Backbone or Lessor equipment within the Corridors to its same level of operational functionality as before any and all damage(s) occurred

as a direct result of negligence or improper or careless installation or construction of the Lessee Fiber Infrastructure within the Corridors.

(a) APPLYING FOR AND OBTAINING THE APPLICABLE CDOT REGION UTILITY PERMIT. The following describes the process by which the applicable CDOT Region Utility Permit can be accessed and obtained at the web site: <https://www.codot.gov/business/permits/utilitiesspecialuse/online-permit-application>.

After accessing the web site:

- Click on Utility and Special Use Permits (Traffic Cone Icon).
- Click on the appropriate CDOT Region on the map.
- Enter email address to receive password.
- Enter password.
- Select Create New Application.
- Under Purpose of Permit, select Installation and complete permit.

8. **MAINTENANCE RESPONSIBILITIES IN THE CORRIDORS.** During the entire term of this Lease Agreement as identified in Section 5 above (TERM), Lessor and Lessee agree to the following maintenance provisions pertaining to the Fiber Backbone within the Corridors and the Lessee Fiber Infrastructure within the Corridors.

Prior to the commencement of any work on the Lessee Fiber Infrastructure in the Corridors, Lessee or Lessee's contractor shall apply for and obtain the applicable CDOT Region Maintenance Permit and comply with all applicable provisions, terms and conditions of the applicable CDOT Region Maintenance Permit in the performance of all maintenance activities on the Lessee Fiber Infrastructure within the Corridors. Lessor shall waive any and all associated fees and costs regarding the applicable CDOT Region Maintenance Permit. Lessor shall not unreasonably withhold or delay issuance of the applicable CDOT Region Maintenance Permit, and in any event shall issue the applicable CDOT Region Maintenance Permit within fifteen (15) days of receiving Lessee's properly completed application provided that no mitigating circumstances, requirements, clearances or other issues must be addressed thereby making issuance of the applicable CDOT Region Maintenance Permit not possible within fifteen (15) days. Lessee or Lessee's contractor or subcontractor shall perform all work in Corridors so as not to cause damage to the Fiber Backbone or Lessor equipment within the Corridors. Lessee or Lessee's contractor shall be solely responsible to remedy any and all damage(s) to the Fiber Backbone or Lessor equipment within the Corridors caused as a direct result of negligence or improper or careless maintenance activities performed on the Lessee Fiber Infrastructure, and Lessee or Lessee's contractor shall reimburse Lessor for any and all cost to repair, replace and restore the Fiber Backbone or Lessor equipment within the Corridors to its same level of operational functionality as before any and all damage(s) occurred as a direct result of negligence or improper or careless maintenance activities performed on the Lessee Fiber Infrastructure.

(a) LOCATES. Lessor shall perform or cause to be performed all fiber locates on the Fiber Backbone within the Corridors within three (3) business days from receipt of Utility Notification Center of Colorado (UNCC) notice on the Fiber Backbone within the Corridors except that failure by Lessor to perform or cause to be performed fiber locates within three (3) business days on the Fiber Backbone within the Corridors shall not entitle Lessee to any damages or loss from Lessor, in any manner whatsoever, for loss of use, which loss of use could be attributed, but not limited to, failure to perform or cause to be performed such fiber locates within three (3) business days. Lessee shall perform or cause to be performed all fiber locates on the Lessee-owned lateral fiber optic

telecommunications cable installed within the Corridors. Lessor shall assume no liability for any damages to Lessee-owned lateral fiber optic telecommunications cable installed in the Corridors that Lessee either performs or causes to be performed or does not perform or does not cause to be performed all fiber locates on the Lessee-owned lateral fiber optic telecommunications cable installed within the Corridors. Lessee shall be responsible to register Lessee-owned lateral fiber optic telecommunications cable installed in the Corridors with UNCC and shall pay for all fees, solely at Lessee's expense, to register such Lessee-owned lateral fiber optic telecommunications cable installed in the Corridors.

(b) ROUTINE PREVENTATIVE MAINTENANCE. Lessor shall perform or cause to be performed routine preventative maintenance, in accordance with Lessor's regular maintenance procedures, processes, practices and protocols, on the Fiber Backbone within the Corridors. Preventative Maintenance shall at a minimum consist of, but not be limited to, performance of the following: inspection of the Fiber Backbone including reinstallation of knocked down fiber markers, replacement of damaged or missing fiber markers, clearing and cleaning debris from all pull boxes, vaults and/or manholes so that they are visible, locates within three (3) business days from receipt of UNCC notice on the Fiber Backbone and splicing on the Fiber Backbone and on Lessor-owned lateral fiber optic telecommunications cable installed within the Corridors as necessary and as required by CDOT; except that Lessor shall not perform or cause to be performed any splicing whatsoever on the Lessee Fiber Strands or on the Lessee-owned lateral fiber optic telecommunications cable installed within the Corridors. For all Routine Preventative Maintenance activities pertaining to the Fiber Backbone and the Lessor-owned lateral fiber optic telecommunications cable installed within the Corridors Lessor shall supply or cause to be supplied all necessary materials at its own expense. For all Routine Preventative Maintenance activities pertaining to the Lessee Fiber Infrastructure and the Lessee-owned lateral fiber optic telecommunications cable installed within the Corridors Lessee shall supply or cause to be supplied all necessary materials at its own expense and shall not seek reimbursement from Lessor for any and all cost associated with routine preventative maintenance performed by Lessee within the Corridors.

(c) EMERGENCY AND EXTRAORDINARY REPAIRS. Lessor shall perform or cause to be performed emergency and extraordinary repairs on the Fiber Backbone within the Corridors in accordance with Lessor's procedures, processes, practices, protocols, standards and specifications. Emergency and extraordinary repairs shall mean repairs required because the Fiber Backbone within the Corridors has been cut, severed or crushed. Lessor shall perform or cause to be performed necessary emergency and extraordinary repairs, including splicing and reconnecting of the fibers in the Fiber Backbone within the Corridors solely at its own expense and shall not seek reimbursement from Lessee unless Lessee causes the damage either through its negligence or willful misconduct. For outages affecting the Fiber Backbone within the Corridors, Lessor shall investigate and prepare response plan to affect a repair of the Fiber Backbone and use commercially reasonable efforts to respond within twenty-four (24) hours to initiate splicing and reconnecting of the fibers in the Fiber Backbone within the Corridors unless Force Majeure, severe weather, highway closures or extreme safety hazards exist; however, in any case failure of Lessor to perform or cause to be performed emergency and extraordinary repairs within twenty-four (24) hours on the Fiber Backbone within the Corridors shall not entitle Lessee to any damages or loss from Lessor, in any manner whatsoever, for loss of use, which loss of use could be attributed, but not limited to, failure to perform or cause to be performed emergency and extraordinary repairs within twenty-four (24) hours. Lessor intends that necessary emergency and extraordinary repairs, including splicing and reconnecting of the fibers and the Lessee Fiber Strands in the Fiber Backbone within the Corridors, will restore the fibers and the Lessee Fiber

Strands in the Fiber Backbone within the Corridors to their pre-emergency and extraordinary repair condition so that such fibers and the Lessee Fiber Strands in the Fiber Backbone within the Corridors are functionally operational and in good working order; except for normal wear and tear as well as other items beyond the control of Lessor for which Lessor shall have no responsibility and for which Lessee shall have no right to bring any claim against Lessor or seek compensation or damages from Lessor. Notwithstanding the aforementioned, if Lessee notifies Lessor within thirty (30) days following emergency and extraordinary repairs regarding issues pertaining to functionally operational and good working order of the Lessee Fiber Strands Lessor agrees to work with Lessee to resolve such issues, and if necessary to replace the Lessee Fiber Strands with existing fiber strands in the Fiber Backbone, if available, that are functionally operational and in good working order. In such case that no fiber strands exist in the Fiber Backbone that are functionally operational and in good working order the Parties agree to work together to resolve the situation in a manner acceptable to both Parties

As used within this Section 8(c) (EMERGENCY AND EXTRAORDINARY REPAIRS) response time shall be defined as the time at which Lessor first receives notice, either from Lessor sources or from other sources, that the Fiber Backbone within the Corridors has been cut, severed or crushed to the time that Lessor arrives on the Corridors to initiate splicing and reconnecting of the fibers in the Fiber Backbone.

(d) NOTIFICATION. In the event that Lessor performs emergency and extraordinary repairs identified in Section 8(c) above (EMERGENCY AND EXTRAORDINARY REPAIRS), Lessor shall notify Lessee as soon as is reasonable and practicable, and shall make reasonable effort to notify Lessee while such emergency and extraordinary repair is in progress. Lessor's notification shall include, to the extent practicable, the nature, location and duration of the emergency and extraordinary repair, and shall be to Lessee representative identified in Section 21 below (NOTICE). A telephone call followed by an email shall constitute acceptable notification.

(e) ENTERING PULL BOXES, VAULTS AND/OR MANHOLES. For safety and security reasons pertaining to the Fiber Backbone within the Corridors neither Party, including but not limited to, that Party's employees, contractors, subcontractors, agents and affiliates, shall enter the other Party's pull boxes, vaults and/or manholes without receiving written permission, which may take the form of email from the Party's representative identified in Section 21 below (NOTICE).

(f) RESTORATION. Each Party shall, with respect to any and all maintenance and repair activities under the Lease Agreement, restore the affected area, including but not limited to, landscaping, trees, sod, sprinkler systems, and pathways, to the same or better condition as before. Lessee shall maintain the Lessee Fiber Infrastructure and the Lessee-owned lateral fiber optic telecommunications cable installed within the Corridors in good repair and in tenantable condition free of trash and debris attributable to the work contemplated in Section 7 above (CONSTRUCTION BY LESSEE IN THE CORRIDORS) and in this Section 8 (MAINTENANCE RESPONSIBILITIES IN THE CORRIDORS) in this Lease Agreement during the term of this Lease Agreement.

(g) COMPLIANCE WITH APPLICABLE CDOT REGION MAINTENANCE PERMIT. Lessee or Lessee's contractor shall comply with all terms, conditions and provisions set forth in the applicable CDOT Region Maintenance Permit regarding performance of maintenance activities including, but not limited to, acceptable days and hours to access the Corridors,

submittal of method of handling traffic (MHT) while performing maintenance activities, and CDOT approval of MHT, safety, insurance and bonding requirements.

(h) APPLYING FOR AND OBTAINING THE APPLICABLE CDOT REGION MAINTENANCE PERMIT. The following describes the process by which the applicable CDOT Region Maintenance Permit can be accessed and obtained at the web site: <https://www.codot.gov/business/permits/utilitiesspecialuse/online-permit-application>.

After accessing the web site:

- Click on Utility and Special Use Permits (Traffic Cone Icon).
- Click on the appropriate CDOT Region on the map.
- Enter email address to receive password.
- Enter password.
- Select Create New Application.
- Under Purpose of Permit, select Maintenance of the Existing Facility and complete permit.

It should be noted that the expiration date of the applicable CDOT Region Maintenance Permit will be the same date on which the Lessee insurance, which is required in accordance with Section 14 below (INSURANCE REQUIREMENTS), expires. Following issuance of the applicable CDOT Region Maintenance Permit the CDOT automated system will send notification to Lessee thirty (30) days prior to the expiration date of the applicable CDOT Region Maintenance Permit. It shall be the sole responsibility of Lessee to ensure that the applicable CDOT Region Maintenance Permit is renewed by contacting applicable CDOT Region Utilities and providing a copy of updated/renewed Lessee insurance.

9. **RIGHT OF ACCESS.** It is understood and agreed that Lessee intends to use the Corridors only for non-exclusive access to use and operate the Lessee Fiber Strands and the Lessee Fiber Infrastructure. Lessee shall also have the right to access the Corridors to perform or cause to be performed construction activities as identified in Section 7 above (CONSTRUCTION BY LESSEE IN THE CORRIDORS) and maintenance and repair activities as identified in Section 8 above (MAINTENANCE RESPONSIBILITIES IN THE CORRIDORS) in accordance with the applicable CDOT Region Utility Permit or the applicable CDOT Region Maintenance Permit and in accordance with all applicable terms, conditions and provisions in this Lease Agreement. Lessor shall, at all times have the right to access and inspect the Fiber Backbone within the Corridors and the Lessee Fiber Infrastructure within the Corridors to ensure that they comply with environmental regulations, the applicable CDOT Region Utility Permit or the applicable CDOT Region Maintenance Permit and the terms, conditions and provisions of this Lease Agreement. Lessee shall not use the Lessee Fiber Strands and the Lessee Fiber Infrastructure within the Corridors for any purposes other than those identified in this Lease Agreement and the applicable CDOT Region Utility Permit or the applicable CDOT Region Maintenance Permit without express written consent of Lessor.

10. **TAXES, UTILITIES, MAINTENANCE AND OTHER EXPENSES.** It is understood and agreed that except as otherwise provided by law, all taxes, assessments, insurance, utilities and other operating costs and the cost of all construction activities as identified in Section 7 above (CONSTRUCTION BY LESSEE IN THE CORRIDORS) and maintenance and repair activities as identified in Section 8 above (MAINTENANCE RESPONSIBILITIES IN THE CORRIDORS) and all other direct costs, charges and expenses of any kind whatsoever respecting Lessee's use and

operating the Lessee Fiber Strands and the Lessee Fiber Infrastructure within the Corridors and non-exclusive occupancy within the Corridors shall be borne by Lessee and not by Lessor so that the lease payment to Lessor as identified in Section 6 above (LEASE PAYMENT) shall not be reduced, offset or diminished directly or indirectly by any cost or charge.

11. **ASSIGNMENT.** This Lease Agreement shall be binding upon and inure to the benefit of the Parties hereto and their respective successors and assigns. Neither Party shall assign, sublet, delegate, or transfer any of its rights or obligations hereunder without the prior written consent of the other Party; except that Lessee shall not be allowed to assign this Lease Agreement, in whole or in part, to any commercial telecommunications provider or to any affiliate or subsidiary of any telecommunications provider or to any agency or entity that uses Lessee Fiber Strands to generate any profit including providing or subleasing such capacity on the Lessee Fiber Strands. If Lessee assigns this Lease Agreement, Lessee shall use a written agreement to make that assignment, and Lessee shall include language in that agreement that expressly requires any assignee to assume all of Lessee's obligations and duties under this Lease Agreement for the term of this Lease Agreement. Furthermore, Lessee shall provide Lessor, within fifteen (15) days of executing such assignment, a copy of the assignment agreement.

12. **TERMINATION AND DEFAULT.**

(a) **TERMINATION BY LESSOR.** In the event Lessor believes that Lessee has not complied with the material terms of the Lease Agreement, Lessor shall notify Lessee in writing with specific details regarding the exact nature of the alleged noncompliance or default. Lessee shall have thirty (30) days from the receipt of the Lessor's written notice: (1) to respond to Lessor contesting the assertion of noncompliance or default; or (2) to cure such default; or (3) in the event that, by nature of the default, such default cannot be cured within the thirty (30) day period, initiate reasonable steps to remedy such default and notify Lessor of the steps being taken and the projected date that the cure will be completed. In the event Lessee fails to respond to the Lessor's notice or in the event that the alleged default is not remedied within thirty (30) days of the date agreed to by the Parties, then Lessor may terminate this Lease Agreement by providing Lessee with one hundred eighty (180) days' notice of termination in writing. In such an event, Lessee shall compensate Lessor in the amount equivalent to the following year's annual lease payment as identified on **Exhibit A** as Liquidated Damages for the early termination of this Lease Agreement. In the event that less than one year remains on the term of this Lease Agreement, Lessee shall forfeit the prorated amount remaining on its annual lease payment.

(b) **TERMINATION BY LESSEE.** If at any time during the term of this Lease Agreement, it becomes economically, technologically, or legally advisable in Lessee's business judgment for Lessee to discontinue utilizing the Lessee Fiber Strands and the Lessee Fiber Infrastructure in the Corridors, Lessee may terminate this Lease Agreement on thirty (30) days written notice to Lessor. In such an event, Lessee shall compensate Lessor in the amount equivalent to the following year's annual lease payment as identified on **Exhibit A** as Liquidated Damages for the early termination of this Lease Agreement. In the event that less than one year remains on the term of this Lease Agreement, Lessee shall forfeit the prorated amount remaining on its annual lease payment. Such annual lease payment for termination shall accompany the written notice as described above. If any required certificate, other than any certificate required in Section 14 below (INSURANCE REQUIREMENTS) in this Lease Agreement, permit, license or approval is denied, canceled or otherwise terminated, for reasons beyond the reasonable control of Lessee, so that Lessee is unable to use the Lessee Fiber Strands and the Lessee Fiber

Infrastructure in the Corridors for its intended purpose, Lessee may terminate this Lease Agreement without paying Lessor Liquidated Damages, upon thirty (30) days' notice.

(c) DEFAULT. Either Party may terminate the Lease Agreement by giving written notice of breach or default if the other Party: (1) becomes insolvent, unable to pay debts when due, or the subject of bankruptcy proceedings not terminated within thirty (30) days of any filing; or makes a general assignment for the benefit of creditors; or if a receiver is appointed for substantially all of its property; or (2) breaches or defaults on its obligations under this Lease Agreement and fails to cure the breach or default within thirty (30) days after receipt of written notice provided, however, that the cure period shall be extended if the nature of the cure is such that it reasonably requires more than thirty (30) days to cure, and the defaulting Party commences the cure within the thirty (30) day period and thereafter continuously and diligently pursues the cure to completion in which case this Lease Agreement shall not terminate. Notwithstanding anything to the contrary in this Lease Agreement, including but not limited to the exhibits, in no event shall the cure period for either Party to cure any breach or default be less than the cure period set forth in this same Section 12(c). Furthermore, notwithstanding anything to the contrary in this Lease Agreement, including but not limited to the exhibits, in no event may either Party terminate this Lease Agreement as the result of an uncured breach or default unless the requirements above in Section 12(a) or in Section 12(b) have been satisfied.

(d) TERMINATION NOTICES. All notices of cancellation under this Section 12 (TERMINATION AND DEFAULT) shall become effective on the third day following the date the notice is postmarked or upon receipt if personally delivered, unless otherwise agreed to between Lessor and Lessee and specified in the termination notice.

(e) EFFECT OF TERMINATION. If either Party terminates this Lease Agreement pursuant to, and in accordance with the provisions identified above in Section 12(a) or in Section 12(b), Lessor shall rescind Lessee grant of non-exclusive to the Corridors and Lessor, at its sole discretion and authority, may require Lessee, at Lessee's sole cost and expense, to disconnect and remove the Lessee Fiber Infrastructure and all Lessee-owned lateral fiber optic telecommunications cable installed within the Corridors from the Corridors, and restore the affected area to its condition prior to the beginning of this Lease Agreement, normal wear and tear excluded, no later than ninety (90) days following the termination date. If Lessee refuses or fails to disconnect and remove the Lessee Fiber Infrastructure and all Lessee-owned lateral fiber optic telecommunications cable installed within the Corridors from the Corridors no later than ninety (90) days following the termination date, Lessor shall have the right to have the Lessee Fiber Infrastructure and all Lessee-owned lateral fiber optic telecommunications cable disconnected and removed from the Corridors at Lessee's sole expense.

13. RELOCATION. Each Party recognizes that from time to time Lessor may be required to relocate the Fiber Backbone within the Corridors or a portion thereof as a result of a project in the public State Highway ROW. Lessor shall be solely responsible for all costs incurred to relocate the Fiber Backbone, including the Lessee Fiber Strands within the Corridors; however, Lessor shall not be responsible, in any manner whatsoever, to relocate or to incur any costs attributed to such relocation of the Lessee Fiber Infrastructure and the Lessee-owned lateral fiber optic telecommunications cable installed in the Corridors. Lessor shall use commercially reasonable efforts to give Lessee at least thirty (30) days prior notice of construction activity to relocate the Fiber Backbone, including the Lessee Fiber Strands within the Corridors, and due to the vested interest that Lessee has in the Corridors, Lessor shall use commercially reasonable efforts to give Lessee notice of relocation as soon as Lessor becomes aware of such relocation and Lessor shall

keep Lessee well informed throughout the entire relocation process, including but not limited to, development of relocation project plans and schedules. Lessor agrees to make all reasonable attempts to minimize Lessee downtime resulting from such relocation; however, Lessee understands that many factors and circumstances can affect such relocation and thus have an effect on minimizing Lessee downtime resulting from such relocation. Lessee shall be solely responsible to relocate, including all costs incurred to relocate, the Lessee Fiber Infrastructure and the Lessee-owned lateral fiber optic telecommunications cable installed in the Corridors and Lessee shall coordinate such relocation with Lessor and shall perform or cause to be performed such relocation in conjunction with and based on Lessor's relocation schedule so that such Lessee relocation does not impede, delay, conflict or cause obstruction to Lessor relocation of the Fiber Backbone, including Lessor-owned infrastructure and Lessor-owned lateral fiber optic telecommunications cable in the Corridors.

14. INSURANCE REQUIREMENTS.

(a) GENERAL. Lessee shall obtain and maintain, at all times during the duration of this Lease Agreement, insurance in the kinds and amounts detailed below or in the kinds and amounts identified on the applicable CDOT Utility/Special Use Permit Application for the applicable CDOT Region Utility Permit or the applicable CDOT Region Maintenance Permit, whichever is greater. Lessee shall require any contractor or subcontractor working for Lessee on the Corridors to obtain like coverage. The following insurance requirements must be in effect during the entire term of the Lease Agreement. Lessee shall, at its sole cost and expense, obtain insurance on the Lessee Fiber Infrastructure including Lessee-owned lateral fiber optic telecommunications cable, equipment and all other personal property located within the Corridors against loss resulting from fire, theft or other casualty. All policies evidencing the insurance coverage required hereunder shall be issued by insurance companies licensed to do business in the State of Colorado with a minimum A.M. Best financial rating of A-, VII. If Lessor or the State Controller changes its insurance requirements at any time during the term of this Lease Agreement Lessee shall update its policy to comply with these requirements. Lessee shall update such policy to become effective upon the date provided by Lessor regarding such change to Lessor or the State Controller insurance requirements. Lessor shall notify Lessee of any changes to Lessor or the State Controller insurance requirements no later than sixty (60) days prior to such change.

(b) WORKER'S COMPENSATION. Workers' Compensation Insurance as required by State statute, and Employer's Liability Insurance covering all employees acting within the course and scope of their employment and work on the activities authorized by this Lease Agreement.

(c) GENERAL LIABILITY. Commercial General Liability Insurance written on ISO occurrence form CG 00 01 10/93 or equivalent, including self-insurance to the levels noted in the Colorado Governmental Immunity Act (if applicable), covering Corridors operations, fire damage, independent Consultants, blanket contractual liability, personal injury, and advertising liability with minimum limits as follows:

1. \$1,000,000 each occurrence;
2. \$1,000,000 general aggregate;
3. \$1,000,000 products and completed operations aggregate; and
4. \$50,000 any one fire.

If any aggregate limit is reduced below \$1,000,000 because of claims made or paid, Lessee, or as applicable, its contractor, shall immediately obtain additional insurance to restore the full aggregate limit and furnish to Lessor a certificate or other document satisfactory to Lessor showing compliance with this provision.

(d) AUTOMOBILE LIABILITY. Automobile Liability Insurance covering any auto (including owned, hired and on-owned autos) with a minimum limit of \$1,000,000 each accident combined single limit, self-insurance to the levels noted in the Colorado Governmental Immunity Act is acceptable (if applicable).

(e) POLLUTION LEGAL LIABILITY. If any operations are anticipated that might in any way result in the creation of a pollution exposure, Lessee shall also provide Pollution Legal Liability Insurance with minimum limits of liability of \$1,000,000 Each Claim and \$1,000,000 Annual Aggregate. Lessor shall be named as an Additional Insured to the Pollution Legal Liability policy of any Lessee contractors or subcontractors. The Policy shall be written on a Claims Made form, with an extended reporting period of at least two year following finalization of this Lease Agreement.

(f) UMBRELLA OR EXCESS LIABILITY. Umbrella or Excess Liability Insurance with minimum limits of \$1,000,000. This policy shall become primary (drop down) in the event the primary Liability Policy limits are impaired or exhausted. The Policy shall be written on an Occurrence form and shall be following form of the primary. The following form Excess Liability shall include Lessor as an Additional Insured of any Lessee contractors or subcontractors.

(g) ADDITIONAL INSURED. Lessor shall be named as Additional Insured on the Commercial General Liability Insurance and Automobile Liability Insurance policies (leases and construction contracts require additional insured coverage for completed operations on endorsements CG 2010 11/85, CG 2037, or equivalent) required of Lessee and any contractor hereunder.

(h) PRIMACY OF COVERAGE. Coverage required of Lessee and any contractor by this Lease Agreement will be primary over any insurance or self-insurance program carried by the State of Colorado and/or the Colorado Department of Transportation.

(i) CANCELLATION. Lessee shall provide notice to Lessor at least thirty (30) days prior to cancellation by certified mail to the representatives identified in Section 21 below (NOTICE). This paragraph (i) shall supersede any cancellation notice requirements in the applicable CDOT Utility/Special Use Permit Application or the applicable CDOT Region Utility Permit and the applicable CDOT Region Maintenance Permit.

(j) SUBROGATION WAIVER. The insurance policies related in any way to this Lease Agreement and secured and maintained by Lessee or contractor or subcontractor as required herein shall include clauses stating that Lessee shall waive all rights of recovery, under subrogation or otherwise, against Lessor and the State of Colorado, its agencies, institutions, organizations, officers, agents, employees and volunteers.

(k) CERTIFICATES. In order for this Lease Agreement to be executed, Lessee, or as applicable, its contractors and subcontractors, shall provide certificates showing insurance coverage required by this Lease Agreement to Lessor within seven (7) business days of the execution date of this Lease Agreement. No later than fifteen (15) days prior to the expiration date of any such coverage, Lessee or contractor or subcontractor shall deliver to the Notice

Address of Lessor certificates of insurance evidencing renewals thereof. At any time during the term of this Lease Agreement, Lessor may request in writing, and Lessee or contractor or subcontractor shall thereupon within ten (10) days supply to Lessor, evidence satisfactory to Lessor of compliance with the provisions of this Section 14 (INSURANCE REQUIREMENTS). Insurance coverage must be in effect or this Lease Agreement is in default.

(l) CONTRACTOR REQUIREMENTS. If Lessee engages a contractor or subcontractor to act independently from Lessee on the Corridors, for which no consent of Lessor is required, that contractor or subcontractor shall be required to provide an endorsement naming Lessor as an Additional Insured on its Commercial General Liability, and Umbrella or Excess Liability policies.

15. INDEMNIFICATION AND HOLD HARMLESS.

(a) Lessee shall include in any of its agreements with its contractors, subcontractors, agents and affiliates performing any work in the Corridors that such contractors, subcontractors, agents and affiliates shall indemnify, save, and hold harmless Lessor and the State of Colorado, its employees and agents, against any and all claims, damages, liability and court awards including costs, expenses, and attorney fees and related costs, incurred as a result of any act or omission by its employees, agents, or assignees pursuant to the terms of this Lease Agreement except to the extent caused by the negligence or willful misconduct of Lessor or the State of Colorado, its employees and agents, or any third-party user; however, the provisions hereof shall not be construed or interpreted as a waiver, express or implied, of any of the immunities, rights, benefits, protection, or other provisions, of the Colorado Governmental Immunity Act, CRS 24-10-101 et seq., or the Federal Tort Claims Act, 28 U.S.C. 2671 et seq., as applicable, as now or hereafter amended. Failure by Lessee to include in any of its agreements with its contractors, subcontractors, agents and affiliates performing any work in the Corridors the requirement to comply with this same Section 15 (INDEMNIFICATION AND HOLD HARMLESS) in its entirety shall impute to Lessee the responsibility to perform this same Section 15 (INDEMNIFICATION AND HOLD HARMLESS) in its entirety.

(b) NOTWITHSTANDING ANYTHING CONTRARY IN THE AGREEMENT INCLUDING LESSEE'S INDEMNIFICATION AND INSURANCE OBLIGATIONS, IN NO EVENT SHALL EITHER PARTY BE LIABLE TO THE OTHER FOR ANY INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, EXEMPLARY, OR CONSEQUENTIAL DAMAGES, INCLUDING, WITHOUT LIMITATION, THOSE BASED ON LOSS OF REVENUES, PROFITS, OR BUSINESS OPPORTUNITIES, FRUSTRATION OF ECONOMIC OR BUSINESS EXPECTATIONS, LOSS OF CAPITAL, COST OF SUBSTITUTE PRODUCT(S), FACILITIES, OR SERVICES, OR DOWN TIME COST.

16. OWNERSHIP. Lessor represents that Lessor owns and controls the Fiber Backbone located within the Corridors and located within the public State Highway ROW and Lessee specifically understands that Lessor owns and controls the Fiber Backbone located within the Corridors and located within the public State Highway ROW at all times relevant to this Lease Agreement. The undersigned, signing on behalf of Lessor, warrants and represents himself or herself to be an authorized agent of CDOT for the purposes of entering into this this Lease Agreement between Lessor and Lessee pursuant to the terms, conditions and provisions identified in this Lease Agreement.

17. APPLICABLE LAW. The laws of the State of Colorado and rules and regulations issued pursuant thereto shall be applied in the interpretation, execution and enforcement of this Lease

Agreement, and any legal action concerning the provisions hereof shall be brought in the City and County of Denver, State of Colorado. Any provision of this Lease Agreement, whether or not incorporated herein by reference, which provides for arbitration by any extra-judicial body or person or which is otherwise in conflict with said laws, rules and regulations shall be considered null and void. Nothing contained in any provision incorporated herein by reference which purports to negate this or any other special provision in whole or in part shall be valid or enforceable or available in any action at law whether by way of complaint, defense or otherwise. Any provision rendered null and void by the operation of this provision will not invalidate the remainder of this Lease Agreement to the extent that this Lease Agreement is capable of execution.

18. **COMPLETE AGREEMENT.** This Lease Agreement, including **Exhibit A** and **Exhibit B**, supersedes any and all prior or contemporaneous written or oral agreements and there are no covenants, conditions or agreements between the Parties regarding the subject matter of this Lease Agreement except as set forth herein. No prior or contemporaneous addition, deletion, or other amendment hereto shall have any force or affect whatsoever unless embodied herein in writing. No subsequent novation, renewal, addition, deletion or other amendment hereto shall have any force or effect unless embodied in a written contract executed and approved pursuant to the State of Colorado Fiscal Rules and by an authorized representative of Lessee.

19. **CAPTIONS, CONSTRUCTION, AND LEASE AGREEMENT EFFECT.** The captions and headings used in this Lease Agreement are for identification only, and shall be disregarded in any construction of the Lease Agreement provisions. All of the terms of this Lease Agreement shall inure to the benefit of and be binding upon the respective heirs, successors, and assigns of both Lessor and Lessee. If any provision of this Lease Agreement shall be determined to be invalid, illegal, or without force by a court of law or rendered so by legislative act then the remaining provisions of this Lease Agreement shall remain in full force and effect.

20. **NO VIOLATION OF LAW.** Lessee shall not commit, nor permit the commission of, any act or thing, which shall be a violation of any ordinance of the municipality, City, County, or of any law of the State of Colorado or the United States. Lessee shall not use the Corridors for any manner, which shall constitute a nuisance or public annoyance. The signatories hereto aver that they are familiar with 18-8-301, et seq., (Bribery and Corrupt Influences) and 18-8-401, et seq., (Abuse of Public Office), C.R.S., as amended, and that no violation of such provisions is present. The signatories aver that to their knowledge, no state employee has any personal or beneficial interest whatsoever in the service or property described herein.

21. **NOTICE.** All notices, demands and requests required or permitted to be given under this Lease Agreement (collectively the "Notices") must be in writing and shall be deemed to have been given as of the date, notwithstanding anything to the contrary in this Lease Agreement, such Notice is (i) delivered to the Party intended, (ii) delivered to the Notice Address below or the then designated address of the Party intended, (iii) sent via email to the email address given below provided sending Party has a confirmation acknowledging receipt of the email by receiving Party, (iv) rejected at the then designated address of the Party intended, provided such Notice was sent prepaid, or (v) sent by nationally recognized overnight courier or by United States Certified Mail, return receipt requested, postage prepaid and addressed to the then designated address of the Party intended. The initial notice address designated for each Party shall be as listed below. Upon at least ten (10) days' prior written notice, each Party shall have the right to change its address to any other address within the United States of America.

Regarding the Work to be performed as outlined in this Lease Agreement and subsequent issues throughout this Lease Agreement term, persons to be contacted that represent the Parties include:

LESSOR:

Colorado Department of Transportation
Bob Fifer, Business Development &
Planning Manager
425C Corporate Circle
Golden, CO 80401
303-512-5808
Bob.fifer@state.co.us

LESSEE:

Name and contact information here

And a copy to:

Colorado Department of Transportation
Wes Maurer, ITS Branch Manager
425C Corporate Circle
Golden, CO 80401
303-512-5820
Wes.maurer@state.co.us

And a copy to:

Name and contact information here

With a copy to:

Colorado Dept. of Transportation
2829 West Howard Place
Denver, CO 80204
Attn: Chief Engineer

22. EXECUTIVE DIRECTOR'S APPROVAL. This Lease Agreement shall not be deemed valid until it has been approved and fully executed by the Executive Director of the Colorado Department of Transportation, or his designee, and by Lessee.

23. HAZARDOUS MATERIALS. Lessee shall include in any of its agreements with its contractors, subcontractors, agents and affiliates performing any work in the Corridors that such contractors, subcontractors, agents and affiliates shall defend, indemnify and hold harmless Lessor and any employees, agents, contractors, and officials of Lessor against any and all damages, claims, liability, loss, fines or expenses, including attorney's fees and litigation costs, related to the presence, disposal, release or clean-up of any contaminants, hazardous materials or pollutants on, over, under, from or affecting the Corridors subject to this Lease Agreement, which contaminants or hazardous materials its employees, agents, or officials has caused to be located, disposed, or released on the Corridors. Such agreements shall also require contractors, subcontractors, agents and affiliates be responsible for all damages, claims and liability to the soil, water, vegetation, buildings or personal property located thereon as well as any personal injury or property damage related to such contaminants or hazardous materials. Notwithstanding, neither Lessee nor its contractors, subcontractors, agents and affiliates shall not be responsible, and have no obligation to indemnify Lessor for hazardous materials existing or installed by others, including Lessor and any third-party users, along and within the Corridors. Failure by Lessee to include in any of its agreements with its contractors, subcontractors, agents and affiliates

performing any work in the Corridors the requirement to comply with this same Section 23 (HAZARDOUS MATERIALS) in its entirety shall impute to Lessee the responsibility to perform this same Section 23 (HAZARDOUS MATERIALS) in its entirety.

24. **NO NEW PERMANENT STRUCTURES.** Except as authorized by this Lease Agreement, no permanent structures or facilities of any kind shall be erected or moved upon or within the Corridors by Lessee without the express written prior permission of Lessor. Any such structure/facilities erected or moved upon or within the Corridors without the express written consent of Lessor may be immediately removed by Lessor at the expense of Lessee.

25. **BINDING AGREEMENT.** This Lease Agreement shall be binding upon and inure to the benefit of the partners, heirs, executors, administrators, and successors of the respective Parties hereto.

26. **ADDITIONAL PROVISIONS.** Lessee shall also comply with the following:

- (a) Construction MAY NOT commence until written authorization is received from Lessor, and Lessee has obtained applicable CDOT Region Utility Permit;
- (b) Perform all work in a safe and workmanlike manner consistent with generally accepted construction standards;
- (c) Perform all work in such a way to minimize, as is reasonably practical, any interference with the operations of Lessor;
- (d) Obtain, prior to the commencement of any work, the necessary federal, state, and local permits, licenses and approvals;
- (e) Comply with all terms and conditions of applicable CDOT Region Utility Permit, including regarding the times and places for the performance of the work;
- (f) Install the Lessee Fiber Infrastructure including Lessee-owned lateral fiber optic telecommunications cable only at the specific location(s) described in the Lessee Fiber Infrastructure Plans and approved by CDOT and identified on the applicable CDOT Region Utility Permit; and
- (g) Not pledge or cause a lien or encumbrance of any kind to be created on the Corridors or on any other Lessor property or facilities or have a right to pledge or cause such a lien or encumbrance unless a lien or encumbrance of any kind on the Corridors is expressly permitted elsewhere in this Lease Agreement and expressly approved in writing by Lessor.

27. **INDEPENDENT CONTRACTOR.** Lessee shall perform its duties hereunder as an independent contractor and not as an employee of CDOT or the State of Colorado. Neither Lessee nor any agent or employee of Lessee shall be deemed to be an agent or employee of CDOT or the State of Colorado. Lessee and its employees and agents are not entitled to unemployment insurance or workers compensation benefits through CDOT or the State of Colorado and CDOT or the State of Colorado shall not pay for or otherwise provide such coverage for Lessee or any of its agents or employees. Unemployment insurance benefits shall be available to Lessee and its employees and agents only if such coverage is made available by Lessee or a third party. Lessee shall pay when due all applicable employment taxes and income taxes and local head taxes incurred pursuant to this Lease Agreement. Lessee shall not have authorization, express

or implied, to bind Lessor to any agreement, liability or understanding, except as expressly set forth herein. Lessee shall:

- (a) Provide and keep in force workers' compensation and unemployment compensation insurance in the amounts required by law;
- (b) Provide proof thereof when requested by Lessor; and
- (c) Be solely responsible for Lessee's acts and those of Lessee's employees and agents.

28. **FORCE MAJEURE.** Neither Party shall be considered to be in default in performance of any obligation hereunder if failure of performance is due to forces beyond the control of the Party affected, including, but not limited to, flood, earthquake, storm, fire, lighting, epidemic, war, riot, civil disturbance, labor disturbance, power outage, sabotage, and restraint by court order or public authority, or by any other cause beyond the control of a Party hereto, except where by exercise of due foresight the Party could have reasonably avoided or where by exercise of due diligence the cause could have been overcome.

29. **MODIFICATION OF TERMS AND CONDITIONS.** Lessor and the Lessee hereby reserve the right to alter, amend or modify the terms and conditions of this Lease Agreement upon written agreement by both Parties. Notice of the requested modification shall be given to the representatives identified in Section 21 above (NOTICE) at least thirty (30) days prior to instituting any alteration, amendment or modification of the terms or conditions of this Lease Agreement. Any amendment fully executed by the Parties to this Lease Agreement in accordance with this same Section 29 (MODIFICATION OF TERMS AND CONDITIONS) shall be incorporated herein, made part of and attached to this Lease Agreement. Such notice shall be acceptable in the form of email, with an electronic receipt.

30. **SIGNATURE AUTHORITY.** Each Party represents and warrants that it has taken all actions that necessary or that are required by its respective procedures and applicable law to legally authorize the undersigned signatory for that Party to execute this Lease Agreement on behalf of the Party and to bind the Party to the terms. This Lease Agreement is executed by CDOT under the authority of Section 29-1-203, 43-1-105 and 43-1-110 C.R.S., as amended, and by the Lessee under the authority of the Resolution that is incorporated herein and attached hereto as **Exhibit B**.

[The remainder of this page is intentionally left blank.]

THE PARTIES HERETO HAVE EXECUTED THIS CONTRACT
 Persons signing for Contractor hereby swear and affirm that they are authorized to act on Contractor's behalf and acknowledge that the State is relying on their representations to that effect.

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| <p align="center">STATE OF COLORADO John W. Hickenlooper, GOVERNOR Governor's Office of Information Technology Suma Nallapati, Secretary of Technology and State Chief Information Officer</p> <p>By: _____</p> <p align="center">Brenda Berlin, Deputy Chief Information Officer and Chief Financial Officer</p> <p>Date: _____</p> | <p align="center">LEGAL REVIEW Cynthia Coffman, Attorney General</p> <p>By: _____ Signature –Senior Assistant Attorney General</p> <p>Date: _____</p> |
|--|--|

By _____ Date: _____
 MICHAEL P. LEWIS, EXECUTIVE DIRECTOR
 DEPARTMENT OF TRANSPORTATION
 (Joshua Laipply, P.E., Chief Engineer, for Michael P. Lewis)

By _____ Date: _____
 PRINT NAME: _____
 PRINT TITLE: _____
 PRINT AGENCY/COMPANY: _____

ALL CONTRACTS REQUIRE APPROVAL BY THE STATE CONTROLLER

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|---|
| <p>CRS §24-30-202 requires the State Controller to approve all State Contracts. This Contract is not valid until signed and dated below by the State Controller or delegate. Contractor is not authorized to begin performance until such time. If Contractor begins performing prior thereto, the State of Colorado is not obligated to pay Contractor for such performance or for any goods and/or services provided hereunder.</p> |
| <p>STATE OF COLORADO STATE CONTROLLER Robert Jaros, CPA, MBA, JD</p> <p>By: _____ Department of Transportation</p> <p>Date: _____</p> |